The Only Journal With a Paid Circulation in the Rock Products Industry

Rock Products

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TAYLOR-WHARTON IRON & STEEL CO.

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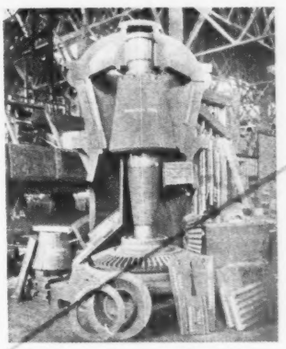

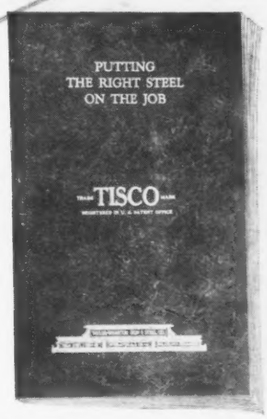

Tisco Manganese Concaves and Mantles for Gyratory Crushers

The remarkable success of Tisco Manganese Concaves and Mantles in all types of standard makes of gyratory crushers in crushing granite, trap rock and other hard materials should recommend this material to all operators of crushing plants. Tisco Manganese Steel possesses all the necessary qualities for satisfactory breaking the hardest rock—toughness, strength and hardness. It gives four to six times the length of service of chilled iron.

We can manufacture quickly from patterns on hand, concaves and mantles, of any standard size or type gyratory crusher.

Putting the Right Steel on the Job

"Profits are based on uninterrupted operations"

There are many kinds of steel; some are tough, some glass hard, some resistant to pressure, some to shock, some to abrasion. Efficiency comes in selecting the particular steel suited to the work which it shall be called upon to perform. A machine is not apt to break down if the parts subject to the greatest wear are made of the proper steel; the proper steel is available, and economy demands its use. Scarcely a day passes that some of our engineers do not make specific applications which prove to be money-saving.

The booklet, "Putting the Right Steel on the Job," sets forth a number of these applications. Send for it.

TAYLOR-WHARTON IRON & STEEL CO., High Bridge, New Jersey

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Chain and sprockets—Dipper teeth—Liners for ball mills—Mantles and concaves for crushers—Jaws for jaw crushers, etc.

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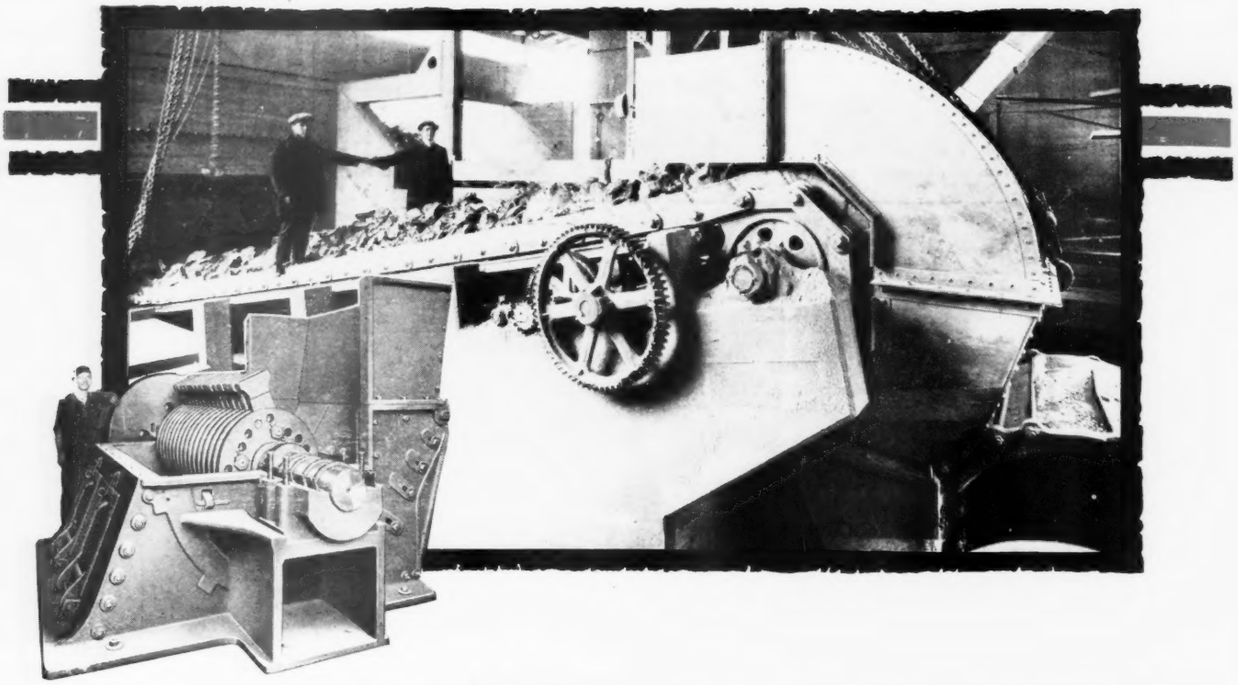

"A Wonderful Machine For Our Work"

Southwestern Portland Cement Co.

The above photo, taken at the El Paso plant of the Southwestern Portland Cement Co., simply illustrates again the main reason why first cost and crushing costs of Williams equipped crushing plants are less. Larger size stone can be handled and reduced to the required size in fewer operations and with less equipment. In the above case, limestone up to 24 in. is crushed to 1½ in. and finer in one reduction with one crusher.

Our claim of lower costs is amply proved when you consider that 75 per cent of American cement plants use Williams crushers. Evidence made even more convincing because of the accurate cost systems employed and keen competition encountered in the cement industry.

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Riverside Portland Cement Co.
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Lime "Establishing a remarkable record."
Luckey Lime & Supply Co.,
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Macadam "Supplanted gyratory and jaw crusher, and product is superior."
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Simple, Efficient, Economical and Satisfactory Lime Plant

New Rotary-Kiln Plant of the Tobey Lime Company, West Stockbridge, Massachusetts

RATHER glowing terms to describe a lime plant! But for minimum of equipment (and therefore investment) and maximum of efficiency, the new rotary-kiln lime plant of the Tobey Lime Co., West Stockbridge, Mass., would be hard to beat. Since that is what all manufacturers seek, the views and description herewith ought to prove interesting.

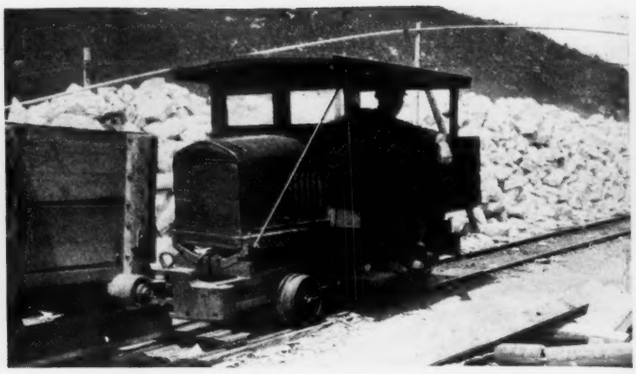
West Stockbridge is in the Berkshire Hills limestone district of Massachusetts, which includes Lee, Adams and other places where lime plants are operated. The limestone deposit at West Stockbridge includes both "hard" and "soft" high calcium stone. The "hard" stone is burned in wood-fired shaft kilns for finishing lime. The so-called "soft" stone is of a character which crumbles badly in the process of calcination, and consequently is seldom successfully burned in shaft kilns.

J. M. Deely (left), president, and Anthony Consolini, superintendent (center), of the Tobey Lime Co.

Two separate quarry faces are

New rotary-kiln lime plant at West Stockbridge, Mass., of the Tobey Lime Co.

Quarry for high calcium chemical lime



Brookfield-Ford gasoline locomotive for transportation

opened. The stone is hand loaded in the quarries, on a contract basis, and brought to the lime plant in 2-yd. end-dump cars. Two Brookfield Ford gasoline locomotives are used to do the hauling.

For the rotary lime kiln the stone is dumped into the hopper of a No. 6 Traylor gyratory crusher. The crusher output is fed through a bin and hopper, through a chute, to a 20-in. conveyor belt. The conveyor belt discharges into a steel tank holding 500 tons. Out of this tank the stone is fed by a Link-Belt reciprocating feeder to the boot of a belt-bucket elevator (16-in.), 50 ft. centers, which discharges through a chute directly into the kiln. The feeder can be, of course, regulated to serve the kiln with varying amounts of stone.

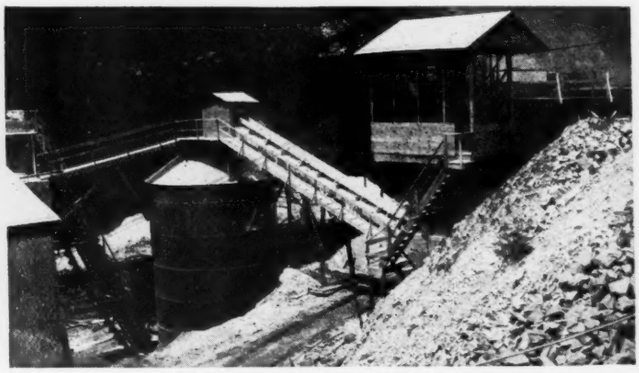
The kiln is a 7x120-ft. Vulcan set at an inclination of 9/16 in. per foot, at such an elevation that the cooler, which is placed on a parallel axis under the kiln, discharges just above the floor level of the plant. By means of a variable-speed General Electric motor (30-hp.) the kiln may be operated at 10 different speeds from ½ r.p.m. to 2 r.p.m. The stone feed elevator is driven by the kiln, so that the feed varies automatically with the speed of the kiln. The reciprocating feeder from the bin to the elevator permits nine different capacities for any given kiln speed.

The kiln lining consists of (from the firing end up) 40 ft. of silica blocks (9-in.), 40 ft. of rotary kiln firebrick liners (9-in.) and 40 ft. of 6-in. rotary-kiln firebrick liners.

The oil burner is one installed by the W. N. Best Furnace and Burner Corp., New York City. The fuel oil is delivered to two tanks on the outside of the building, which have a combined capacity of five carloads. A 20-hp. oil-fired vertical boiler is provided to furnish steam for heating and pumping the oil and for steam used in vaporizing the oil at the burner. The oil pump is a 1½-hp. Worthington.

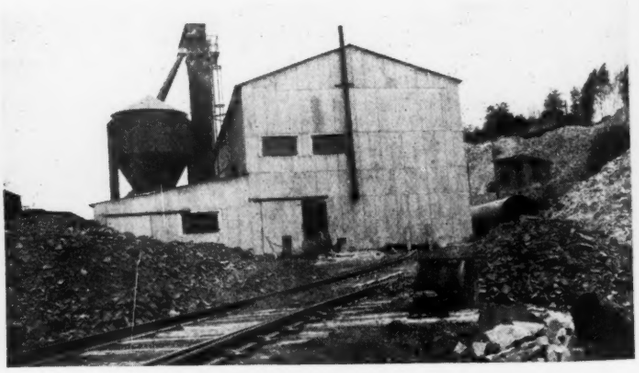
The Vulcan cooler is 4x40 ft. and discharges through a 10-mesh screen at approximately floor level. This permits constant watch and inspection of the output. The fineness of the output is caused by the crumbling of the stone in the kiln. The feed, as already noted, is the output of a gyratory crusher set with a 2-in. opening, there being no intermediate crusher between this primary breaker and

Trestle to crusher and crusher housing

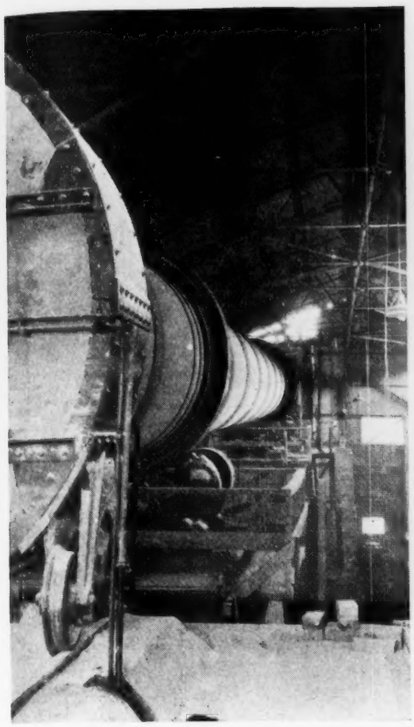


Stone storage tank and elevator to kiln feed

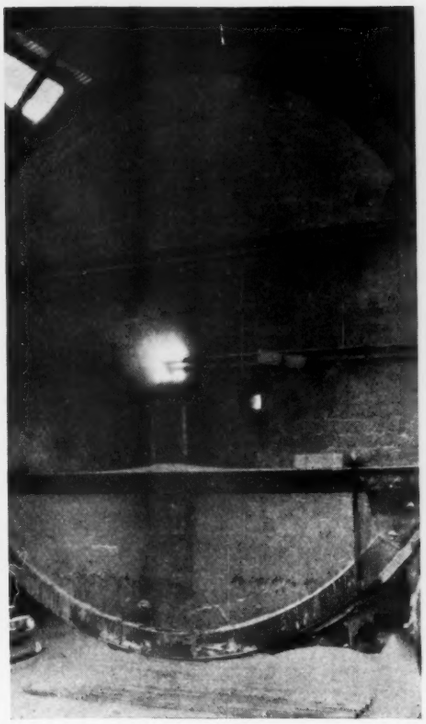
General view showing oil storage tanks (left)



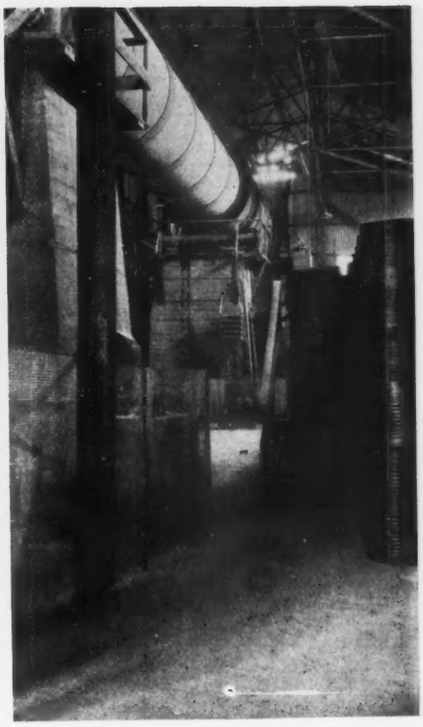
General view showing storage tanks for lime



Kiln from firing platform



Oil burner of rotary kiln



Kiln from below—note height above floor

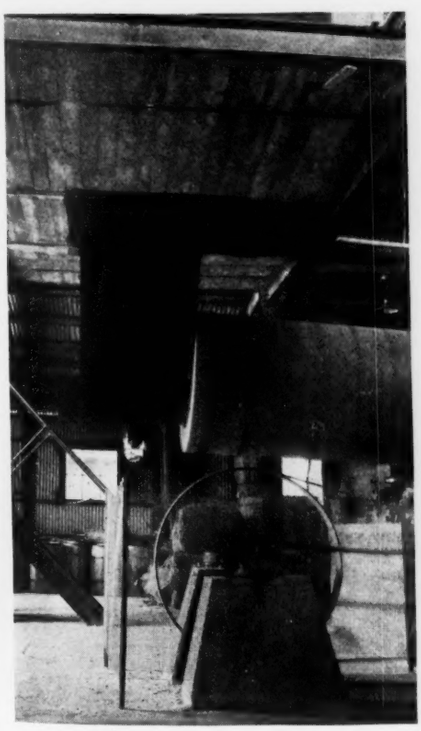
the kiln. All sizes of stone from 2-in. to dust are fed to the kiln. There is little dust. In going through the kiln all sizes are reduced to grains about the size of granulated sugar. The cooler is set at an inclination of ¾ in. to the foot. It is driven by a 5-hp. motor.

The discharge from the cooler as it drops through a hopper in the floor to a screw conveyor is so cool that it can be picked up in the hand. The screw conveyor 12-in.) leads to an enclosed bucket elevator, which in turn discharges to two-way chutes feeding the two 50-ton steel tanks for lime storage.

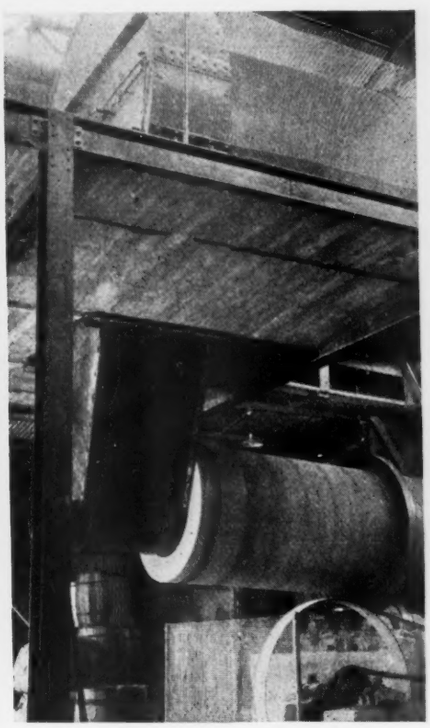
Barrels are filled from the storage tanks by chutes below, as shown in one of the views. The warehouse and loading platform is directly under these bins and the loading track along the side of the building permits car-loading with a minimum of barrel handling.

The capacity of the kiln is about 70 tons of lime per 24-hour day. Provision is made for the installation of a second kiln, parallel to the first.

A study of the layout and the views will show a minimum of expenditure all the

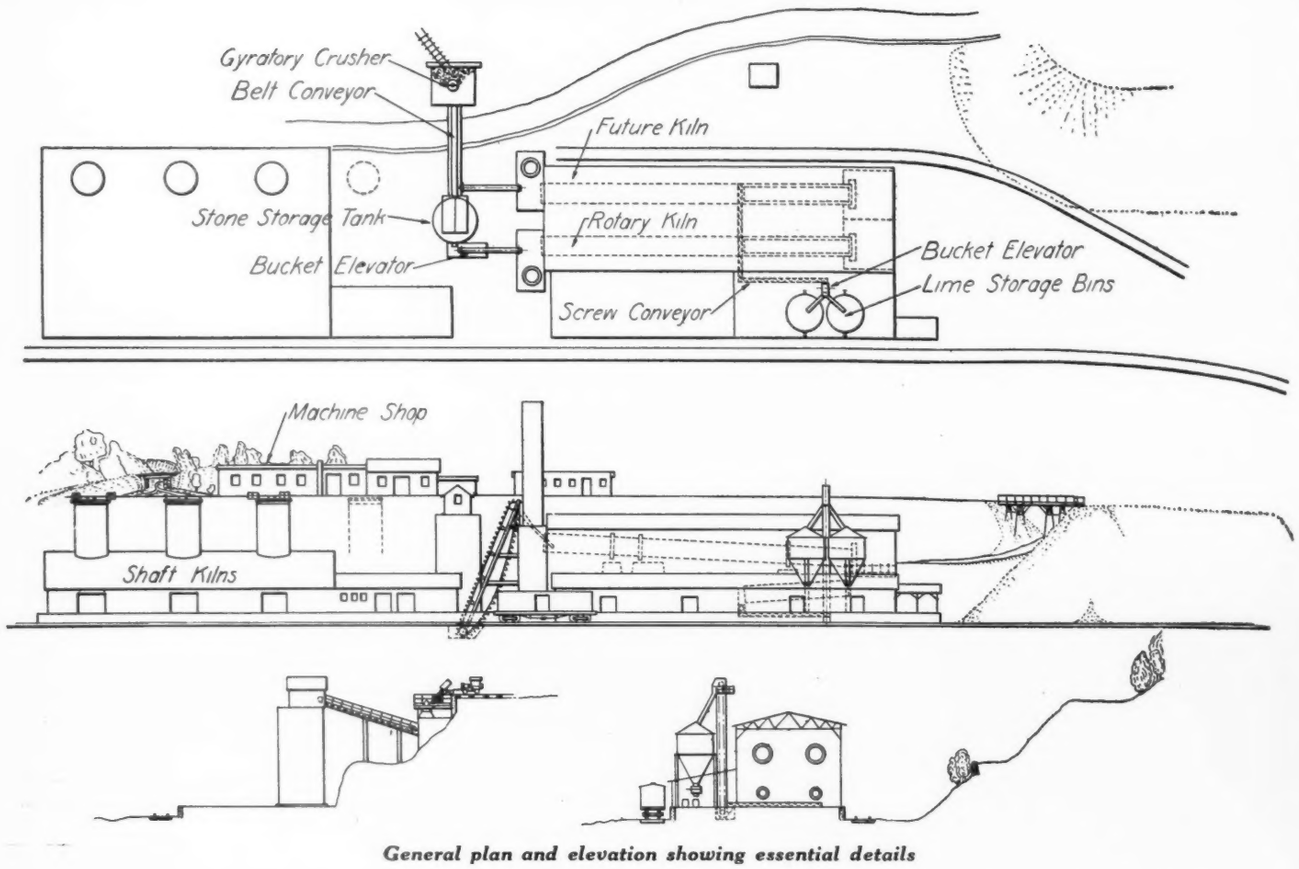


Simple connection between kiln and cooler



Another view of cooler and drive

Spouts on kiln floor under lime bins



General plan and elevation showing essential details

way through, not only in first cost, but in operating cost. The total electric power consumption is only 100 hp., including the crusher. There are only four conveying units in the plant; they are all of the rugged, slow-speed type, designed for 24 hours of continuous operation per day. The number of men required to operate, not including the quarry, is six per shift, including the superintendent. When loading finished lime is not done, two men may take care of lime manufacture.

The lime is shipped in paper-lined wood barrels and in steel barrels and is much in demand in the chemical trade.

The plant was designed by Howell D. Pratt, consulting engineer, 50 Church street, New York City; the construction work is all steel and concrete and was done by the Wilbur G. Hudson Co., New York City; the oil tanks were installed by the Dover Boiler Works, Dover, N. J.; the lime tanks by the Pittsburgh-Des Moines Steel Co., Pittsburgh, Penn.; the kilns by the Vulcan Iron Works, Wilkes-Barre, Penn.; the conveying equipment by the Link-Belt Co., Philadelphia; the motors by the General Electric Co. and the crusher by the Traylor Engineering and Manufacturing Co.

J. M. Deely is president of the Tobey Lime Co. and Anthony Consolini is superintendent. J. M. Deely and his uncle, John Deely, are also the owners of the Lee Lime Co., with plants at Lee, Mass., and the Connecticut Lime Co. plant at Canaan, Conn.

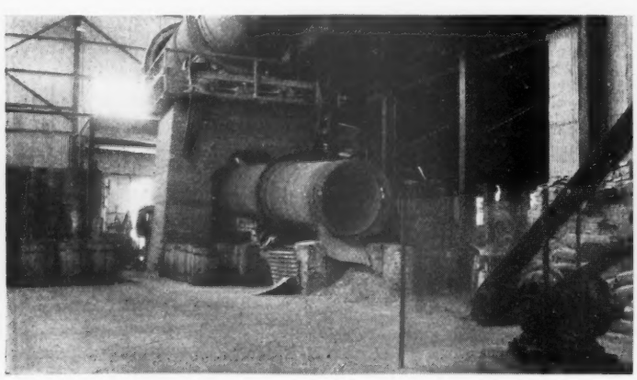
Increase in Material Prices

"CEMENT FACTS," published by the Cement Information Service, 61 Broadway, New York City, is broadcasting the following table, which is of interest to many producers of rock products.

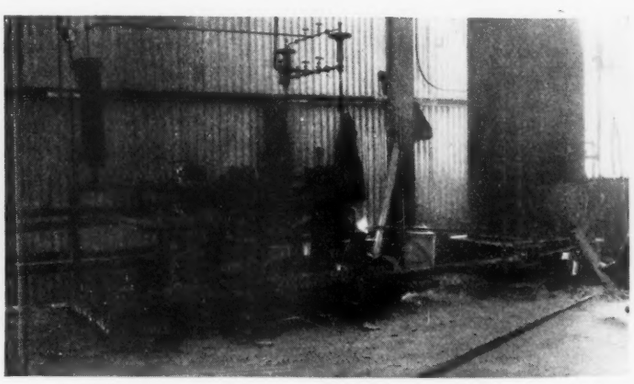
Comparative Prices as of December, 1923

	Per cent increase over 1913
Lime (lump) average U. S.	139.5
Plate glass, 3 to 5 ft. New York	132.4
Turpentine, New York	119.1
Brick, common	116.2
Linseed oil, New York	98.7
Douglas fir at mills No. 1	90.1
Yellow pine flooring at mills, B and better	83.2
Building materials in general	78.0
Oak, white, plain No. 1, Cincinnati	75.6
Portland cement	74.9

(Source—Bureau of Labor Statistics)



Cooler discharging through hopper in floor



Worthington oil pump and boiler for kiln burner

Northwestern Gravel Company's New Plant

THE Cherokee plant of the Northwestern Gravel Co., of Des Moines, Iowa, is the fourth to be built and operated by this company. It is situated on the bank of the Little Sioux river which affords an ample water supply and an opportunity for disposing of the waste water from the plant.

The gravel and sand is excavated with a boom dragline which can dig 200 tons an hour. The material is loaded into 4-yd. side dump cars and brought in to the plant hopper by a small steam locomotive.

The plant hopper is of concrete and is protected from the weather by a shed roof, which is a feature of a number of modern gravel plants. A 24-in. conveyor takes the material to the primary screening and crushing plant. This is placed between the hopper and the main washing plant and is another excellent feature found in plants of newer design. It saves considerable in the length of return elevators besides other advantages.

The feed from the hopper to the belt is regulated by a 24-in. apron feeder, which insures a steady feed to all the plant units.

The crusher is a No. 5 gyratory and the screen is a 48-in. by 10-ft. stone screen. The reject of the screen is crushed and falls on a flat conveyor which returns it to the plant hopper where it passes again through the apron feed and by the inclined conveyor to the screen. This is an excellent method of handling the "return" as it keeps the feed to the washing plant steady regardless of the proportion of the crude material that has to be crushed. As all crushed material is returned to the screen there is no chance for a flat stone to slip through the crusher and then join the screen undersize.

The undersize of the primary screen goes to the No. 2 conveyor which takes it to the washing plant where it is washed and screened into commercial sizes. Six Link-Belt conical screens, in two rows, and two Link-Belt conical sand separators are the equipment of this part of the plant. The gravel screens have 1¼-in. and ½-in. perforations and the sand screens 5/16-in. perforations. The sand passing the 5/16-in. screens flows over a launder screen with 3/16-in. perforation which takes out the fine sand which is sent to the second of the two conical sand separators. The plant products are hence three sizes of gravel and two of sand.

There are five storage bins set beside the track with the usual bin gates for loading.

Unusual Construction Methods

An unusual feature of the plant construction is the method of supporting the No. 2 conveyor. It is carried on trussed bridges with two towers. The illustrations show clearly the construction of these bridges and also the way in which they were put up. The towers were built first and then the bridges, which were put together on the ground were hoisted into place.

There are a number of advantages to this construction. It is much simpler and easier to build than the usual bents, each of which has to be of a different height. It is also much better adapted for making a change in the angle of the belt conveyor, should such a change be necessary since only three points of support have to be altered.

The plant produces 2000 tons a day and only five men are employed excepting the pit crew. One man is required at the hopper, one at the crusher and one at the washer. Two men look after the car loading and the shifting of cars.

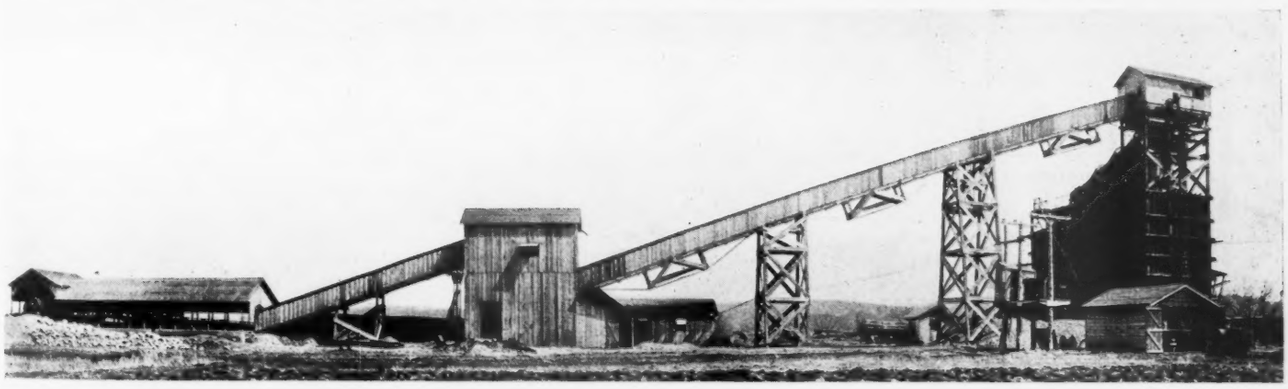
Water for washing is pumped from the river, which is only 100 ft. away, by a 6-in. centrifugal pump.

Everything about the plant is completely housed, which is a feature that should be included in every plant design. It not only protects the men from the heat of the sun and from the cold but it insures a longer life to machinery and belts—especially belts.

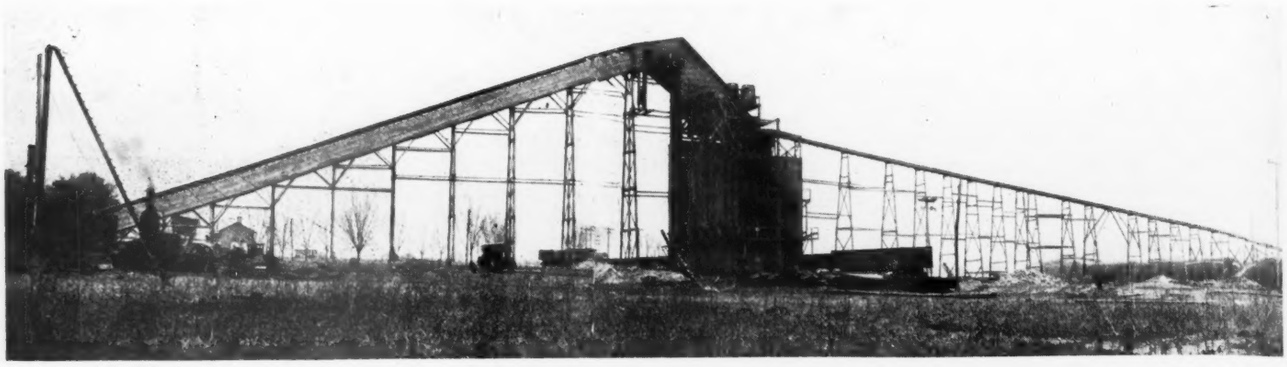
All machinery is driven by electric motors.

The plant was designed by C. S. Huntington, engineer of the Link-Belt Co., who also designed the three plants earlier built by the Northwestern Gravel Co.

Left—Raising the trussed bridges between the towers. Right—The trussed bridges in position



The completed plant; receiving hopper at left, crushing plant in center and washing plant at right



Main washing plant of Alabama Sand and Gravel Co. The screens set at right angles to the conveyor and the waste flume which is shown at right of bins

Digs with Dredge, Dragline and Steam Shovel

Alabama Sand and Gravel Company Has a Three-Part Operation That Makes It One of the Largest Producers of the Montgomery, Ala., District

THE operation which is now carried on by the Alabama Sand and Gravel Co. of Montgomery, Ala., was for a long time conducted by the Hugger Bros. Gravel Co. H. L. Bible and his son, J. C. Bible, took over the management of the property about two years ago.

Bible is a name well known in the sand and gravel industry. H. L. Bible for a long time managed and was the sole owner of what is now the Dixie Sand and Gravel Co. of Chattanooga, Tenn. He has not only been engaged in sand and gravel production for a good many years but in one capacity or another has visited practically every plant east of the Mississippi river and has been consulted in the design and operation of many of these plants. His son has also had a wide experience, having been with the New England Sand and Gravel Co. and others as the manager before coming to Montgomery.

The original operation of the Alabama company as Mr. Bible took it over was by a pump dredge and the plant was a simple one fitted with gravity screens. The dredge and plant are still in use and will be continued in use, except that a new gravity screening plant is being built to take the place of the original plant which is desintegrating from so long a period of service. But to add capacity a new washing and screening plant has been erected and is now in operation. At the time of the writer's visit a locomotive crane and clamshell bucket were being used to dig the bank material for this new plant, but now the plant is served by a Class 24 Bucyrus dragline with a 3½-yd. bucket and a 100-ft. boom.

A third operation conducted by the company on the same ground is that of a Marion 60-ton steam shovel, used to dig bank run material for railroad ballast.

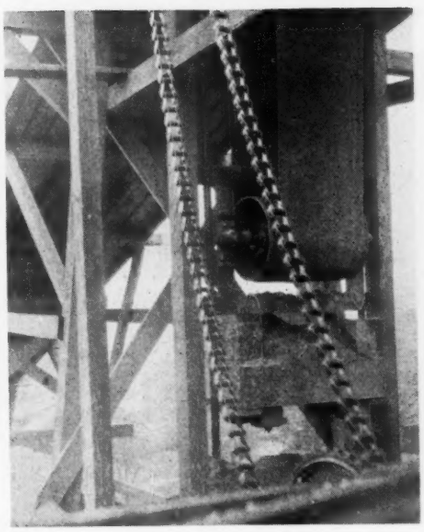
Regular standard gage steel railroad cars are used to bring the material to the new washing plant and the company has three Baldwins and one Pennsylvania locomotive to handle the gravel trains and to switch cars about the yard.

The new washing plant might be described as a "straight" Stephens-Adamson plant, since it contains so many of the features that are found in the plants designed and erected by this company. The bins have a greater capacity in proportion to the daily output than any plant which was noted in the Montgomery district. These bins are built of "cribbing;" that is, of 2x6-in. rough lumber laid flat one on top of another. This method of building a bin used to be almost universal, not only in sand and gravel plants but in grain

Left—Washing plant and bins. Right—Receiving hopper at which the standard gage cars are unloaded

elevators, ore bins and the like. It is not as much used today, although it has the advantage that it is an economical form of construction where small sizes of timber can be obtained from local mills, thus saving heavy freight charges. The bins are well reinforced by "buck stays" and rodded through; and the solid construction of the bin walls makes the bins an excellent support for the screens and other machines of the washing plant.

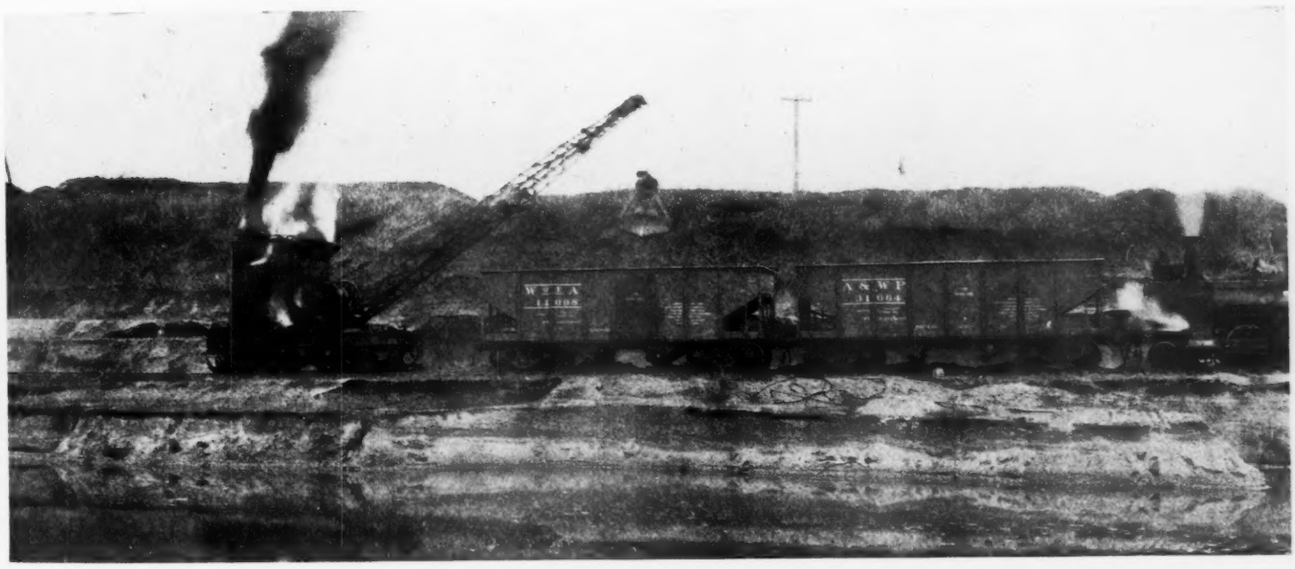
The cars which are brought in from the pit have hopper bottoms and discharge into a concrete hopper under the track. From this the material is fed to the 30-in. belt conveyor by an apron feeder. The conveyor runs in a gallery, covered in from the weather, which has an ample walkway so that examination of the belt and troughing rolls and idlers is easily made. The belt itself is 6-ply rubber covered and it runs on ball bearing troughing rolls and idlers of the self-greasing type, so that only occasional attention need be given them. A gravity take-up keeps the tension on the belt the same at all times.



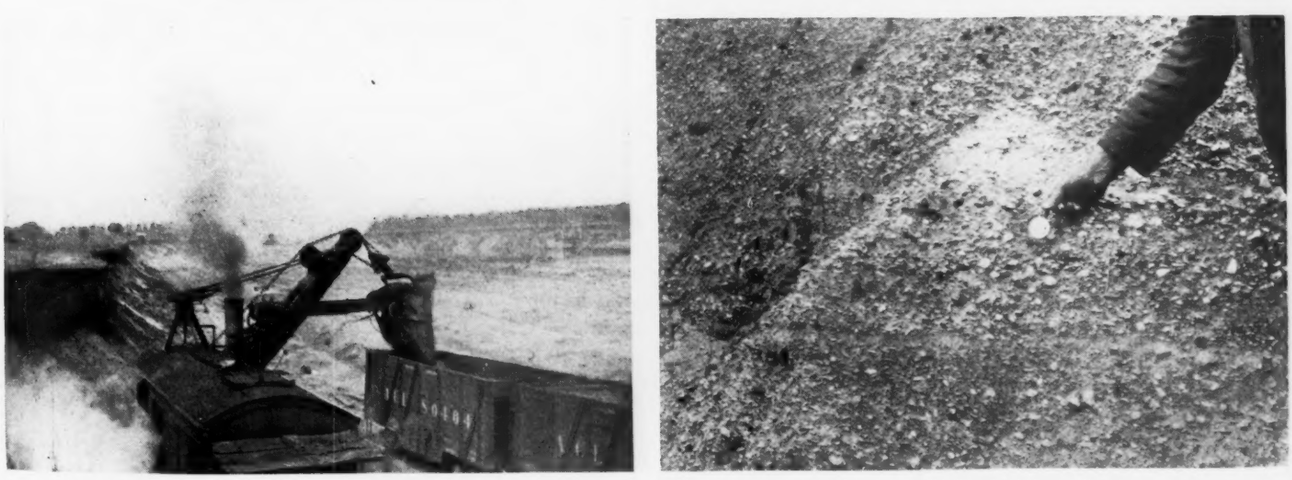
Gravity take-up on plant conveyor is a special feature

The belt ends in a chute which leads down to the two batteries of screens and which is set at about 45 deg. As this is not covered in with a penthouse (as it is in most plants) it gives the whole plant a curious appearance although the construction is quite as strong as usual and somewhat less timber is needed. The conveyor and gallery are supported on bents and not on towers as is a more usual construction in this field.

This plant is of the "right angle" type, having the two lines of screens at 90 deg. to the belt conveyor instead of being carried on in a straight line. These screens are of the Gilbert type found in most Stephens-Adamson plants. The Gilbert screen is a good washer so that scrubbers do not often have to be used with it. It is a conical screen which has only the large end open. A short shaft from the



Locomotive crane and clamshell bucket digging sand and gravel from below the water

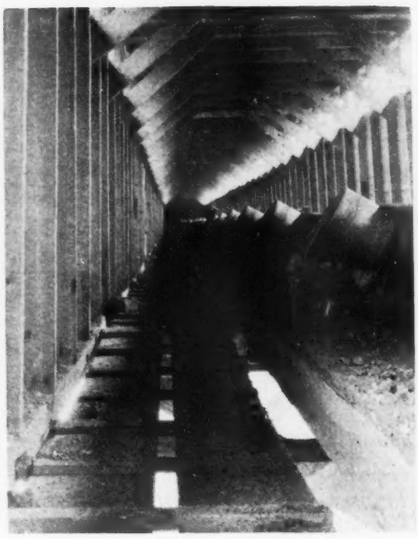


Left—Steam shovel loading railway ballast from bank. Right—Close-up of deposit. No pebble exceeds 3 in. in diameter

closed small end goes through a long bearing, and a counterweight on the other end of the shaft balances the weight of the screen. The large open end is both the feed and discharge end, but the feed is carried back into the screen by a chute so that the feed drops almost at the small end of the screen.

Jets of water under strong pressure are used to wash the material in this screen. The jet nozzles are of flattened pipe and they are set to play on the material where it falls on the screen and at the point to which the material is lifted by rolling in the screen. In this way all the material is rolled over and over in the jet and all lumps are rapidly broken up and the pebbles are given a thorough scouring to remove any films of clay.

The screens have the perforations usually found in this field, 1½-in., ¾-in. and ¼-in. for the sand screen. All the products but the sand fall into separate bins.

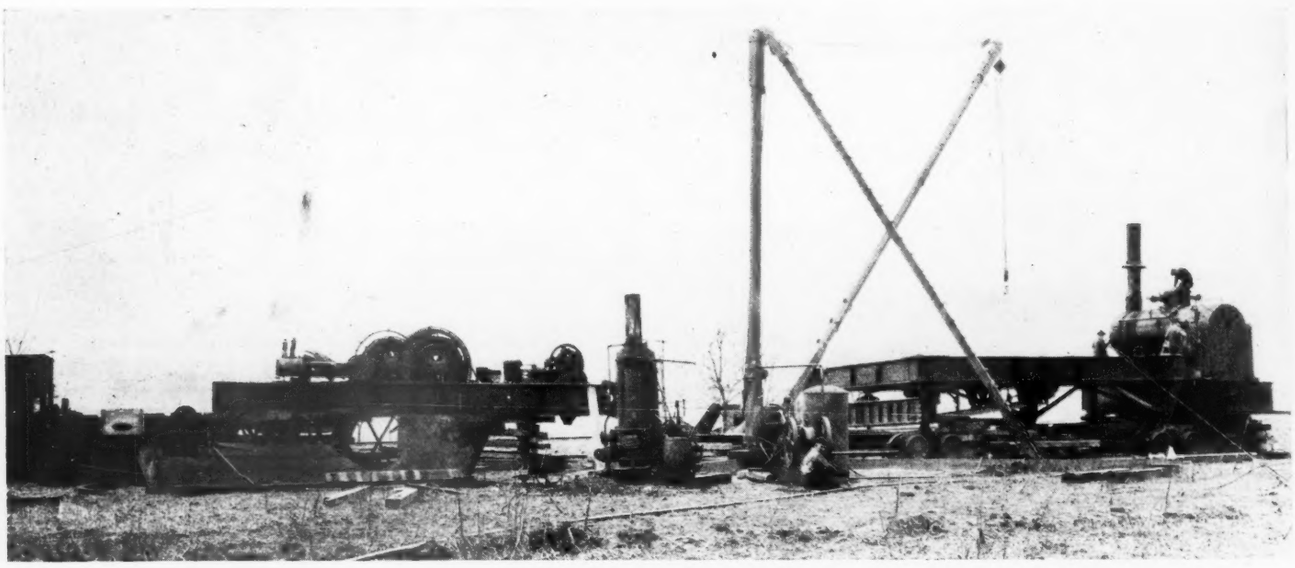


Interior of 30-in. conveyor gallery

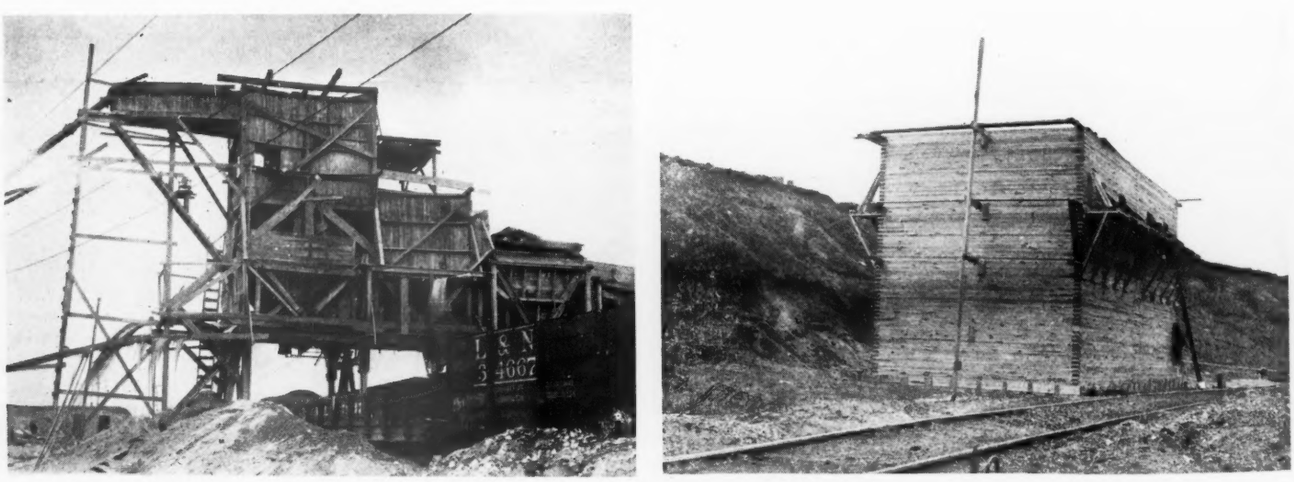
The oversize of the first screen is a separate product as there is nothing larger than 3-in. diameter in the deposit and no crusher is needed.

The sand is caught in two wooden sand settlers in series, the second settling the sand in the overflow from the first. The sand from the first is concrete sand and from the second "No. 2" or mason's sand, for which there is an unusually heavy demand in this section. These settlers have valves that are operated by hand through small ropes that run over pulleys near the discharge launder of the settlers.

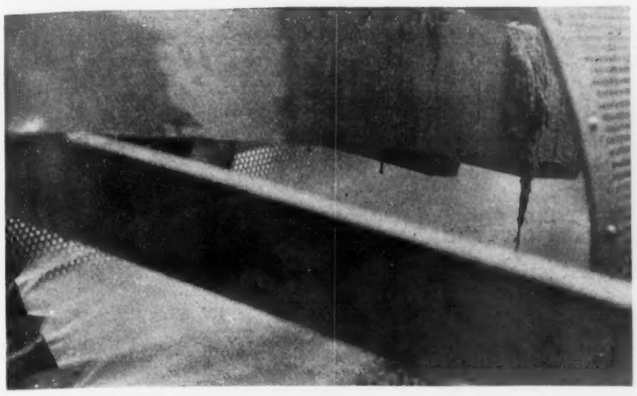
The gravity screening plant is soon to be dismantled but its construction is of interest as the screen plan will be duplicated in the new gravity screening plant now being built. The discharge from the dredge falls on a flat "fanning" table where it is spread out and made to lose its force. It then passes over a ⅜-in.

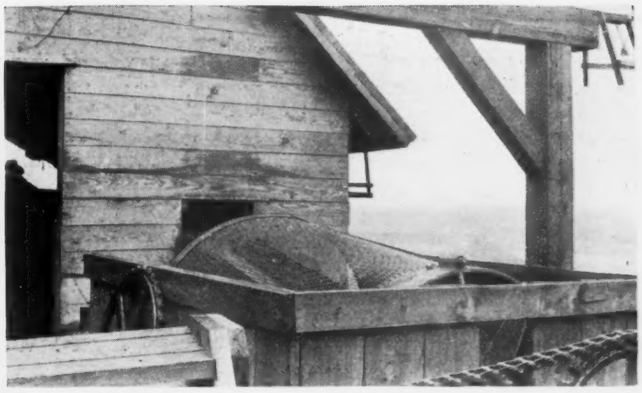


Setting up a new dragline excavator which will have grecter digging capacity than the crane and bucket

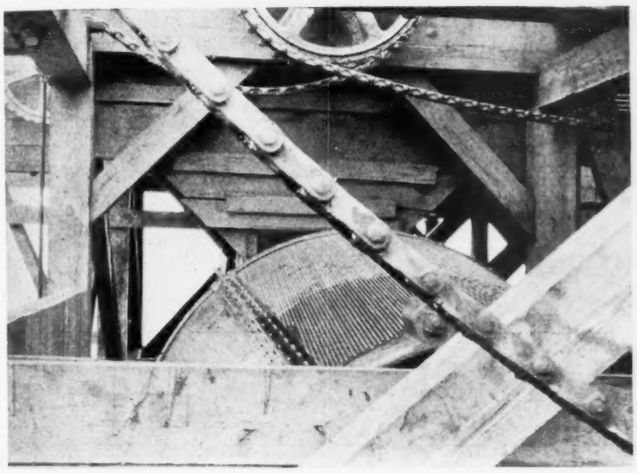


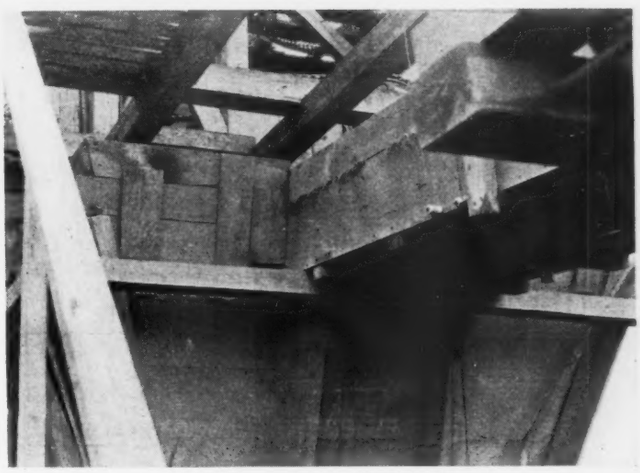
Left—Old gravity screening plant (supplied by dredge) now discarded. Right—Bins for new gravity screening plant which has replaced it





Left—Washing jets of flattened pipe. These are set to strike the material at the point to which it is lifted by the screen. Right—Screen and housing. The feed launder may be seen through the screen





Left—Washing screen and feed chute. Right—Sand settler

screen set at 45 deg. under the fanning table. The oversize from this screen goes to a small bin and the undersize falls into a hopper from which it flows to a second gravity screen with ¼-in. openings. The oversize of this screen (sold under the trade name of "pebbles") goes to a bin and the undersize goes to a sand tank which is a plain wooden hopper. A ⅛-in. screen can be inserted before the sand tank to make "No. 2" sand. An "oversize screen" can be put in before the ⅜-in. screen when it is desired to make two sizes of gravel above ⅜ in.

The bins in this plant are very small and merely serve to permit cars to be changed without throwing the product on the track. A locomotive has to be kept constantly in service spotting cars on this account. The new gravity screening plant will have bins of sufficient capacity to carry a few carloads so that the plant will not have to shut down if the cars cannot be changed at the particular moment that one is loaded.

The Dredge

The dredge contains a 12-in. Amsco pump with a 350-hp. motor.

The deposit is more or less typical of the deposits in the Montgomery district. It underlies an old cotton plantation which is in a horseshoe bend of the Alabama river and contains about 1000 acres. The top soil is a sandy loam and the overburden, which averages about 5 ft. in depth, is mostly fine sand a part of which can be recovered and sold as "No. 2" sand.

M. H. Andrews, superintendent, in charge of operations

The Deposit

The deposit itself may be considered as a mixture of good concrete sand and pebbles of commercial size with very little clay. A picture of the face of the deposit shows that no pebble in sight exceeds 3 in. in diameter and this was the case with every part of the exposed face that was examined. About one-half of the deposit lies under water and this is worked either by the dredge or the Bucyrus dragline excavator.

The plant is producing between 4000 and 5000 tons per day. At times its ballast loadings cause it to exceed the higher figure. This production puts it among the few large tonnage plants in the South and among the heavy producers of the United States.

H. L. Bible is manager of the company and J. C. Bible is the sales manager. M. H. Andrews is general superintendent in charge of operation.

Liquid-Oxygen Explosives Tried Out in Rock Quarry

Impressive Demonstration of Power of New Explosive Given During a Blast in Pennsylvania

By F. W. O'Neil
Chief Engineer, Ingersoll-Rand Co., New York City

IT is self-evident that substantial economies would result if the quarryman had at his command a cheaper and an equally effective blasting agent—in short, one that would answer as well as dynamite and have, besides, some distinctive merits which would make its adoption especially desirable. Happily, such a medium is to be had in L.O.X.—the accepted abbreviation for liquid-oxygen explosives.

Off and on in this country, both the technical and the popular press have had something to say about this kind of explosive; and a fair percentage of the public is aware that liquid-oxygen explosives were brought to a commercial stage of usefulness mainly through the exigencies of war and the enforced efforts of certain of the European belligerents to conserve their precious stocks of fixed nitrogen.

These informed people also know that L.O.X. has been retained since the cessation of strife as a substitute for dynamite in some important mines abroad, and they are familiar with the fact that the performances of these explosives have been decidedly satisfactory and of much suggestive value. On the other hand, relatively few persons have yet learned that American experts, after much research, have brought the art of manufacturing liquid-oxygen explosives to a more advanced stage than that attained abroad, and are now in a position to give our quarrymen and our mine operators the benefit of these improvements. Probably the measure of this progress can be better understood if we describe a demonstration made recently at a quarry in Pennsylvania. That blast has made it possible for us to draw a direct comparison between the performance of dynamite and L.O.X. when tested under similar service conditions.

Soaking tank, some of the cartridges, and a few of the insulated bottles in which liquid oxygen was transported from the producing plant

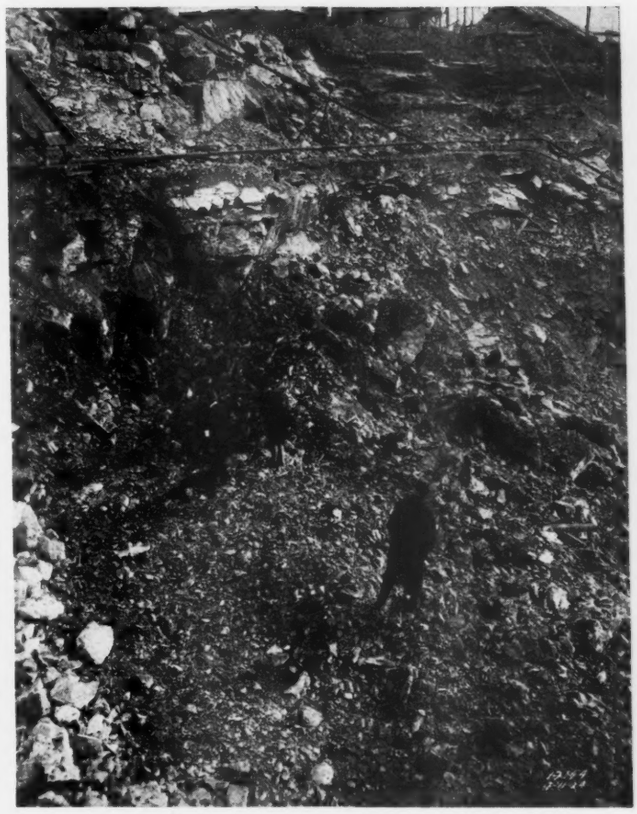
The blast: cloud formed is dust from red, clayey loam used for stemming; shot under regular service conditions in crushed-stone operation

Test at Calcite Quarry, Pennsylvania

On March 5 of the current year some preliminary blasting was done with L.O.X. at Myerstown, Lebanon county, Pennsylvania, on the property of the Calcite Quarry Co., and as a consequence of the excellence of that showing the quarry company gladly assented to a second demonstration. The latter was carried out on April 11 by officials of the Air Reduction Co. and the Ingersoll-Rand Co., who had had to do not only with the designing and the construction of the plant which furnished the liquid-oxygen but who also worked out the details for the application of L.O.X. to the blasting of well-drill holes. It is hardly necessary for us to emphasize that success depends largely upon the get-up of the cartridge. Among the interested spectators were representatives of the mining and quarrying industries as well as others who have to do with the use of explosives.

The object of the second demonstration was to conduct a complete blast in accordance with the usual procedure followed by the Calcite Quarry Co. in its routine operations. This took the form of a 12-hole blast on a 30-ft. bench which was located at one end of the quarry. The drill holes were spaced about 12 ft. apart, as indicated by one of the accompanying illustrations, and each of these holes was 28 ft. deep and 5½ in. in diameter. The cartridges were 5 in. in diameter and 18 in. long, five of them being placed in each hole. For stemming, loose loam was poured into the holes, and none of this material was tamped.

Bench before the blast. The dark patches on the ground are piles of red loam used for stemming. Collars to protect holes after drilling show the disposition of the 12 drill holes



How the bench appeared after the blast had lifted 4500 tons of rock. Crater was formed in front of the two figures near the face of the quarry

Liquid Oxygen Cartridges

The cartridge cases or bags were made of stout muslin and filled with finely divided carbonaceous material which was of a highly absorbent nature. Before soaking in the liquid oxygen, each dry cartridge, in its complete form, weighed 3.25 lb.—the entire lot of 60 cartridges used in the blast weighing in this state 195 lb. As has been determined, each unit of carbon requires for its complete combustion to CO_2 a total of 2.66 units of oxygen. However, the ratio of absorption in the case of the cartridges employed at Myerstown was 3.5 units of oxygen—the excess oxygen allowing a correspondingly longer period in which to load the holes and to make other preparations before evaporation brought the explosives to the CO_2 point. Indeed, the CO_2 point can be passed without materially diminishing the force of the explosion. As a matter of fact, explosive action with cartridges of the kind in question can be obtained any time within two hours after they have been saturated and placed in the drill holes ready for detonating.

The liquid oxygen required for the demonstrating blast was delivered at Myerstown in forty 15-liter transportation bottles—the outward character of which can be seen in one of our illustrations. These containers are so constructed that they minimize evaporation of their liquid-oxygen content while in storage or in transit. When filled and ready for shipment early in the

Boulders that were block-holed and blasted with small cartridges of L.O.X.

Small rock in the foreground show how effectually the block-holed boulders were broken up by L.O.X.

evening of April 7, the net weight of oxygen in the bottles amounted to 1541 lb. When the containers reached their destination in the forenoon of April 11 they held a total of 1014 lb. of liquid oxygen—representing a loss of 527 lb. or 34% during a transportation period of 88 hours. In other words, there was sustained by evaporation a loss of 9.3% for each 24 hours.

When the soaking of the cartridges was begun there was available, therefore, 1014 lb. of liquid oxygen. Sixty-one cartridges were soaked, although but 60 of them were actually utilized for the blast. When the soaking of the entire lot was completed there remained unused 93 lb. of liquid oxygen—that is to say, each cartridge absorbed substantially 15 lb. of the fluid, and the whole lot required 921 lb. for their saturation. The theoretical weight of oxygen needed for having the interspace filled with felt and the soaking chamber lined with copper. One of our photographs plainly show the somewhat simple character of this tank. The container proved entirely satisfactory, and the loss of liquid oxygen by evaporation was surprisingly low.

The cartridges were soaked in the liquid oxygen for about 30 minutes. In the first lot 35 of them were so dealt with—enough to load seven holes. Then a second batch consisting of 25 cartridges was soaked, and when ready these were used to load the five holes remaining. The time intervals were as follows: Started to withdraw the first batch of cartridges from the liquid at 2 p.m.; and first set of seven holes was completely loaded by 2:30. Started to soak the second batch at 2:30, and the remaining five holes were loaded by 3:05 o'clock. All 12 of the Calcite Quarry Co., for a similar blast under ordinary conditions they would use 85 lb. of 40% dynamite in each hole, or a total of 1020 lb.

It was estimated that 4500 tons of rock were broken by the blast, or 6.2 tons per pound of L.O.X. employed. Had 1020 lb. of dynamite been used instead and a like quantity of rock broken, this would have meant 4.4 tons of rock for each pound of explosive. It was the judgment of those in charge of the demonstration that the blast was overshot and that the same result could have been obtained with 20% less L.O.X.

After the blast, about 15 sizable boulders were block-holed — using in each boulder a cartridge 1¼ in. in diameter and 5 in. long. The explosives broke up the boulders into small fragments. It was conclusively determined that L.O.X. cartridges cannot be detonated in the open air by a fuse but that they will, instead, burn rapidly with a bright flame. This

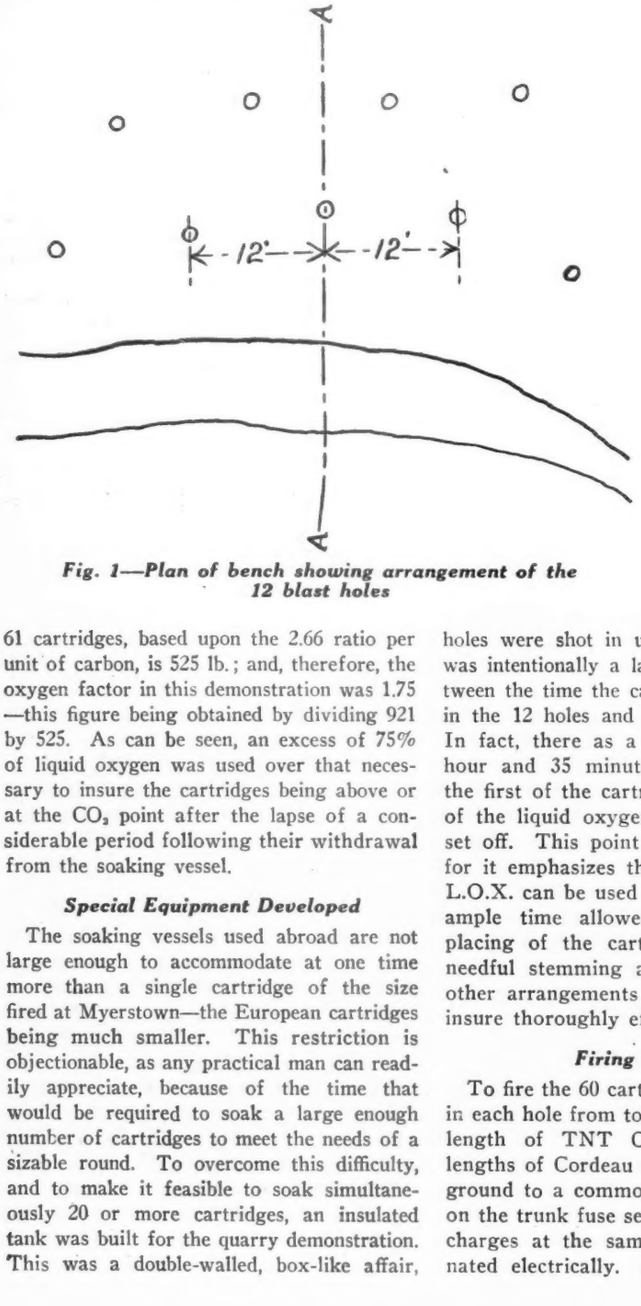


Fig. 1—Plan of bench showing arrangement of the 12 blast holes

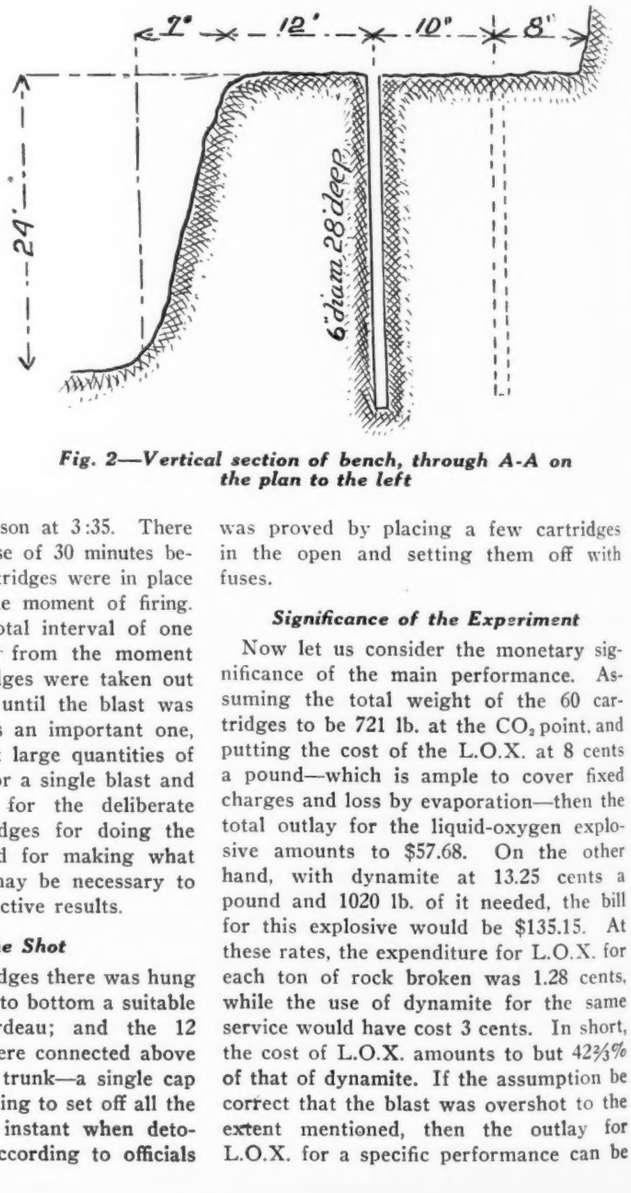


Fig. 2—Vertical section of bench, through A-A on the plan to the left

61 cartridges, based upon the 2.66 ratio per unit of carbon, is 525 lb.; and, therefore, the oxygen factor in this demonstration was 1.75—this figure being obtained by dividing 921 by 525. As can be seen, an excess of 75% of liquid oxygen was used over that necessary to insure the cartridges being above or at the CO_2 point after the lapse of a considerable period following their withdrawal from the soaking vessel.

Special Equipment Developed

The soaking vessels used abroad are not large enough to accommodate at one time more than a single cartridge of the size fired at Myerstown—the European cartridges being much smaller. This restriction is objectionable, as any practical man can readily appreciate, because of the time that would be required to soak a large enough number of cartridges to meet the needs of a sizable round. To overcome this difficulty, and to make it feasible to soak simultaneously 20 or more cartridges, an insulated tank was built for the quarry demonstration. This was a double-walled, box-like affair, holes were shot in unison at 3:35. There was intentionally a lapse of 30 minutes between the time the cartridges were in place in the 12 holes and the moment of firing. In fact, there as a total interval of one hour and 35 minutes from the moment the first of the cartridges were taken out of the liquid oxygen until the blast was set off. This point is an important one, for it emphasizes that large quantities of L.O.X. can be used for a single blast and ample time allowed for the deliberate placing of the cartridges for doing the needful stemming and for making what other arrangements may be necessary to insure thoroughly effective results.

Firing the Shot

To fire the 60 cartridges there was hung in each hole from top to bottom a suitable length of TNT Cordeau; and the 12 lengths of Cordeau were connected above ground to a common trunk—a single cap on the trunk fuse serving to set off all the charges at the same instant when detonated electrically. According to officials was proved by placing a few cartridges in the open and setting them off with fuses.

Significance of the Experiment

Now let us consider the monetary significance of the main performance. Assuming the total weight of the 60 cartridges to be 721 lb. at the CO_2 point, and putting the cost of the L.O.X. at 8 cents a pound—which is ample to cover fixed charges and loss by evaporation—then the total outlay for the liquid-oxygen explosive amounts to $57.68. On the other hand, with dynamite at 13.25 cents a pound and 1020 lb. of it needed, the bill for this explosive would be $135.15. At these rates, the expenditure for L.O.X. for each ton of rock broken was 1.28 cents, while the use of dynamite for the same service would have cost 3 cents. In short, the cost of L.O.X. amounts to but 42⅔% of that of dynamite. If the assumption be correct that the blast was overshot to the extent mentioned, then the outlay for L.O.X. for a specific performance can be

put at 34% of that of dynamite.

A marked feature of the effect of the blast was a somewhat pronounced crater formed at the foot of the quarry face when the bench was lifted. This cavity served admirably to indicate the downward force exerted by the L.O.X.; and the measure of this reaction is especially noteworthy when it is recalled that the loam used for stemming was not tamped at all but merely poured into the holes. This stemming was a red clayey earth which photographed black in some of the pictures, and the dust from this stemming was responsible for the density of the cloud blown skyward at the time of the blast.

The liquid oxygen used in this significant demonstration was produced by a plant operating under the Claude system —the system adopted by the Ingersoll-Rand Co. for the manufacture of liquid oxygen in large quantities. This system has been developed by the renowned French physicist, Dr. Georges Claude; and one of the distinctive characteristics of it is that it is necessary to compress atmospheric air to only 1000 lb., or possibly less, to produce liquid oxygen. By other systems in use, the air must be subjected to an initial pressure of 3500 lb. before liquefaction is accomplished. The greater efficiency and economy of the Claude process should, therefore, be self-evident.

The L.O.X. blast at Myerstown was the first of its kind on a commercial scale ever made in a quarry in the United States; and there are the best of reasons for believing that it was the largest blast of liquid-oxygen explosives so far set off anywhere. It was the climax of much work and marked the overcoming of many obstacles.

Thirty Days Without a Lost-Time Injury

Rockland and Rockport Lime Corporation Succeeds in Setting a Record for June

FOR a long time the Rockland and Rockport Lime Corporation, under the personal supervision of President George B. Wood, has been conducting a special drive on accident prevention. It has the co-operation of John F. Anderson, of the Hartford Accident and Indemnity Co.

The problem at Rockland is by no means simple for the company's plants are spread out over a wide territory, connected by a company operated railway system; there are quarry pits upward of 500 ft. deep with vertical walls—veritable chasms, into which it is very easy to step or fall; some of the plants are none too modern in equipment, and worst of all there was a habit on the part of old employes of expecting accidents and accepting them philosophically.

Workmen's Committees

The usual organization of workmen's safety committees is carried through—with more than the usual amount of democracy in their meetings and inspections. The company employes also have a mutual Relief Association, organized with the assistance of the management, which undoubtedly helps maintain a *sprite de corps*.

An idea of how these workmen's committees function can best be obtained from the following report of their proceedings for the month of June:

POINT KILNS

Meeting held June 27, at 3 p. m.

Present: Alvah A. Smith, chairman, William McKenzie, Mike Salerno, and B. F. Collamore, superintendent of kilns.

An inspection of the plant was held.

Recommendations referred to the General Safety Commmittee were: That iron work on top of No. 4 kiln be repaired; that heavy screening be provided for skylights on roof of shed.

Findings to be cared for by the shed crew were: Repair of coal chute at No. 4 kiln; repair of trestle walkway; repair of hearth at fire box of No. 1 kiln.

HYDRATE MILLS

Meeting held June 26, at 12:30 p. m.

Present: Charles Knights, chairman, Charles Carter, Perley Nash, Clarence Hennigar.

Previous recommendations were reported as completed except the repairing of toilets.

An inspection of the plant was had.

Findings to be cared for by the mills crews were: Set screw on small sprocket of digester in Mill 1 to be made standard; guard for No. 2 feed in Mill 2; guard for guy wire on Perry wharf.

The retiring member of the committee was Perley Nash. Dana Miller was appointed to fill the vacancy.

GREGORY SHED

Meeting held June 26, at 10:15 a. m.

Present: W. G. Upham, chairman, Mervyn Flanders, Ernest Lindsey.

Absent: Benny Nota.

Previous recommendations reported as completed except repairing of shed floor and toilets.

An inspection of plant was had.

Recommendation referred to the General Safety Committee: That the flooring directly back of the office be repaired.

Findings to be cared for by the shed crews were: Protruding bolts on flooring of firing platform in front of kilns 2 and 6; strengthening of railing on stairs to trestle; removal of loose coal on track and walkway on trestle; that the pile of sheet iron opposite stave storage building and the heavy timbers directly opposite the iron, be moved so as to give adequate track clearance.

NORTHEND COOPER SHOP

Meeting held Thursday, June 26.

Present: Harry Post, chairman, Henry Hutchinson, Harry Smith, Daniel Sullivan.

An inspection of the plant was had.

Findings to be cared for by the shop crew were: Replacing of the walkway to toilet; new platform around motor operating matcher, with standard railings and toeboards; the securing of chains at heaters to eliminate slatting.

LIME ROCK RAILROAD

Meeting held June 28, at 12:30 p. m.

Present: K. C. Rankin, chairman, James Doherty, Jesse Smith, Herman Tibbetts, William Reed.

The following suggestions and recommendations were submitted:

1. That the telephone wire in the Cobb-Butler ship yard be raised to the proper height.
2. That the ratchet on brakes of cars be made with a deeper slot.
3. That the pile of rocks near track at Flye's garage be moved so as to give plenty of clearance at that point.
4. That the trestle in rear of the Rockland Hotel be repaired.
5. That a walkway be built for a short distance on the trestle in rear of the Rockland Hotel.
6. That the steam pipe feed to pump on engine 5 be insulated.

Voted, To carry out the above recommendations and suggestions.

GAS KILNS

Meeting held June 30, at 10:15 a. m.

Present: E. B. Packard, chairman, John Smith, George Coultart, Everett Gross.

Recommendation relating to repairs on barrel hatch railing was reported as uncompleted.

An inspection of the plant was had. Good conditions prevailed, excepting the loose material and shafting at point where switch box is located, which should be removed.

The following recommendations were submitted and approved:

1. That the platform between No. 5 kiln and the producer be enlarged.
2. That a short iron ladder be built to extend from platform to top of coal elevator.
3. That something be done to improve dust conditions around head gear. Mr. Packard stated that plans were already under consideration for improving conditions at this point.

ROCKPORT

Meeting held June 28, at 3:15 p. m.

An inspection of the plant was had, and the committee made the following report:

That walks on track trestle be renailed and general repairs made.

That repairs be made on wharf near stock shed.

That the recommendation that "opening in shed back of the Enterprize kiln be boarded over," has never been completed. Referred to Harry Walsh.

Everett E. F. Libby is safety engineer of the company.

Nature, Preparation and Use of Pulverized Coal*

Part XII—Continuation of Description of Burners

By Richard K. Meade
Consulting Engineer, Baltimore, Md.

THE Fuller burner consists of a high speed screw feeder which discharges into a mixing chamber rather than one in which the mixture is made in the burner itself as was customary in the older type burner.

The pulverized coal is delivered by a screw feeder, Fig. 35, to a mixing chamber directly underneath the discharge end of the screw where it is picked up by a stream of secondary air which is supplied by a low pressure blower. This causes the particles of coal to become thoroughly separated from each other and intimately mixed with a percentage of the total air of combustion before entering the furnace through the burner.

There are two types of burners in use; namely, the vertical and horizontal. The horizontal burner naturally would have to be used on rotary kiln furnaces, while the vertical burner can be used on boiler or similar furnaces where the plant design is adaptable thereto.

The mixing chamber for use with the horizontal burner may be attached directly to the discharge end of the feeder as shown in Fig. 35, or it may be connected to the flange of the burner with a suitable connection between the feeder discharge and the mixing chamber. This flexible arrangement permits the burner to be located at a considerable distance from the feeder without any disadvantage in operation. In fact, it is preferable to have the burner at some distance from the feeder inasmuch as the distance travelled by the primary mixture of air and coal will afford more intimate mixture of the constituents than would be possible by having a feeder discharge directly into the burner. Better combustion results are obtained when this preliminary mixture is made as compared with the conditions where the mixture must be made in the furnace itself.

Present practice is to use an individual feeder unit for each burner unit and to limit the amount of coal to be fed to a burner to that amount which will give the most efficient results for a given sized burner.

The horizontal burner, Fig. 36, is adaptable to kiln operation or to any furnace in which the flow of gases is long enough to permit complete combustion to take place before striking a bridge wall or a cold, heat absorbing surface which would have a tendency to retard complete combustion. For rotary kiln practice this burner has the tips turned inward toward the center so that the resultant flame will be ribbon shaped but will not be wide enough to have a scorifying action on the kiln lining. In boiler practice, the ends of this burner tip are straight so as to give the full ribbon effect. The number of burners used per boiler depends on the size of the boiler and the capacity at which it is to be operated. They are placed side by side, giving the effect of a continuous ribbon of flame across the furnace.

The vertical burner shown in plan and cross section, Fig. 37, is arranged so that an adjustment of 8 deg. on either side of the vertical is possible. Thus the burner can be set in the position that gives the best furnace conditions and at the same time keep at such an inclination as is necessary to avoid overheating the front wall. The vertical burners are used in multiples depending on the size of the furnace and the rating at which the boiler is to be operated.

Due to the greater flame length possible and the greater distance traversed by the

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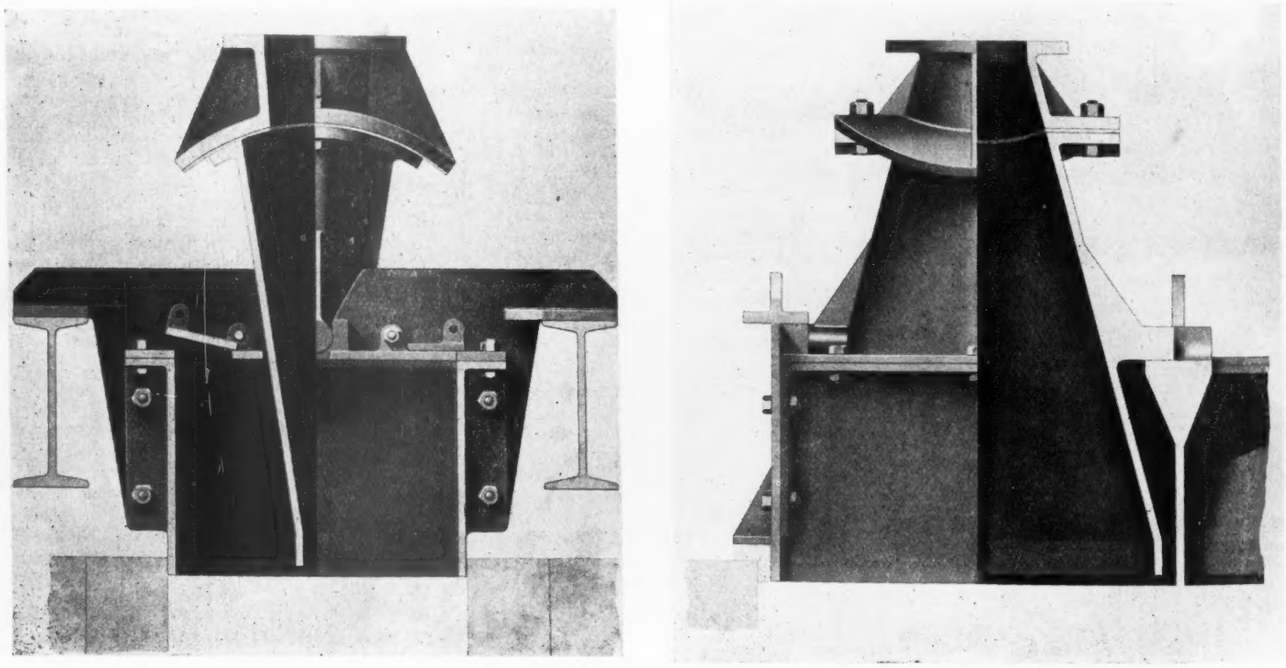


Fig. 37—Fuller vertical burner

products of combustion before striking the heat absorbing surfaces, it is possible to feed more coal through the vertical burner in a given time than through a horizontal burner with equal efficiencies. The selection of the vertical or horizontal burner for a given boiler installation depends entirely upon the coal to be fired and the design of the furnace. Where exceptionally large quantities of coal are to be used and furnace conditions permit, a combination of both vertical and horizontal firing in the same furnace may be used.

The selection of the type of burner will depend also on the character of the coal to be used. It is impossible to fire a low volatile coal through horizontal burners and get efficient combustion. This is because of the small distances which the flame has to travel before being cooled and also because there is no preheating action of the stream of fuel such as takes place when a vertical burner is used, permitting a reverse flow of gases through the combustion chamber.

In both types of burners, secondary air inlet doors are provided to permit of infiltration of the necessary secondary air for complete combustion. Cored holes in the furnace casing are provided through which cold air is drawn at all times thus preventing the burning of the burner tips.

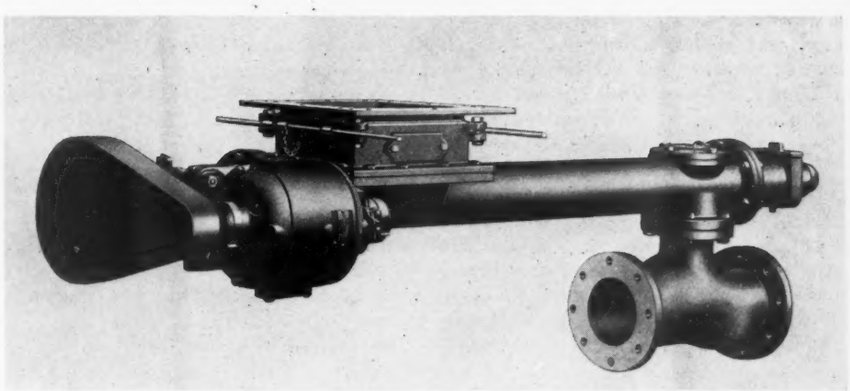


Fig. 35—Fuller-Lehigh screw coal feeder

Holbeck System

In the Holbeck system, the coal is not conveyed to a bin at each individual furnace but instead is mixed with air in proper proportions and the mixture of air and coal is piped to the furnace just as gas would be handled. The essential part of this system consists of (See Fig. 38):

1. A pipe circuit through which the mixture of coal and air circulates, the size of the pipe being roughly proportional to the total quantities required at the furnaces, the design being such that there will always be a sufficient velocity in every part of the circuit to prevent any settling of the coal dust particles in the pipe line.
2. A mixing device by means of which a properly regulated, non-combustible mixture of coal and air is maintained in the circuit.

It will readily be understood that in such a system two things must be taken care of, proper proportioning of the coal and air and a return system by means of which any coal and air not utilized in the furnace can be disposed of. This latter is provided for by returning the mixture of coal and air to a cyclone collector which is located above the bin in which the pulverized coal is stored. The mixing apparatus consists of a motor driven, non-positive blower to supply the air, a variable speed motor that drives the feed screw which feeds the coal out of the coal storage bin and an automatic regulator which controls the coal supply in proportion to the amount of air flowing through the pipe.

The mechanism for controlling the air and coal consists of an air indicating float valve, mounted in the intake pipe of the blower.

With an increased demand for air by the blower, the float moves to a higher position increasing the area of the port openings beneath the float and permitting more air to

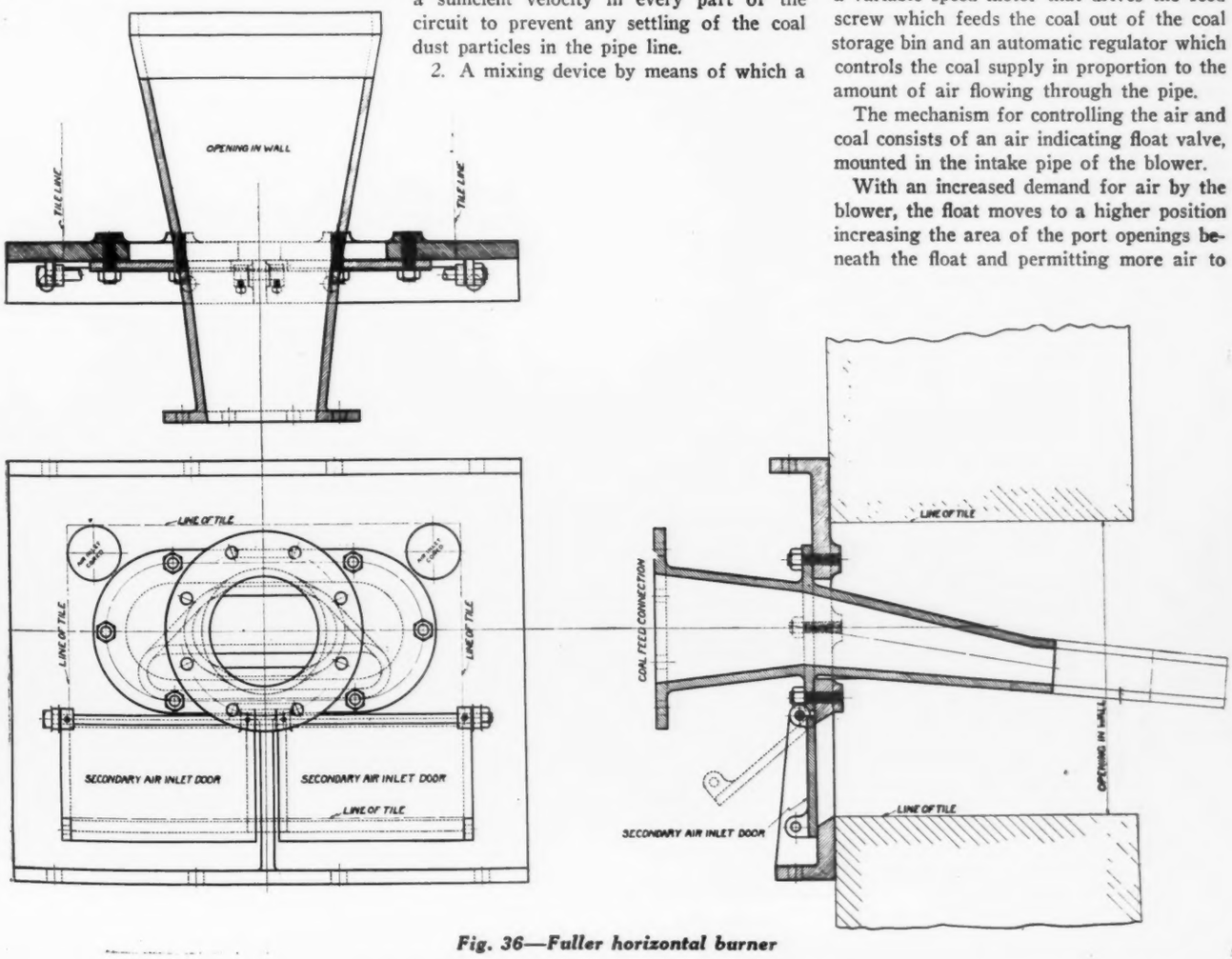


Fig. 36—Fuller horizontal burner

flow to the blower, the air entering the indicator from the bottom. Attached to the float is a stem which extends out through the top of the indicator to which is attached a hand that indicates the volume of air flowing per minute. A signal wire cable is also attached to this stem which leads over pulleys and operates a field rheostat which controls the speed of the variable speed motor which drives the feed screws in the bottom of the pulverized coal bin that serves the system. In this way the amount of coal which is fed into the system is made proportionate to the amount of air entering the intake of the blower.

When a burner at a furnace is opened so as to take air and pulverized coal out of the system, the air pressure in the line naturally drops slightly, just as the pressure on a water pipe drops when a spigot is opened. This slight drop in pressure permits the distributing blower or fan to deliver a larger volume of air. As a result of this the indicator float rises slightly operating the electrical apparatus which speeds up the feed screw motor in proportion, so that the relation of the coal to the air in the circulating mixture is kept constant.

The mixture of air and powdered coal in the distributing pipe is so proportioned that the amount of coal is far in excess of the quantity of air required to burn it. Thus any combustion or explosion in the pipe circuit can not occur.

As the mixture of air and coal passes the valve of the burner, a baffle in the distributing pipe deflects a portion of the air and coal. Sufficient air is then added to the coal and air mixture at the burner to obtain complete combustion and also to regulate the quality of flame desired. The quantity of powdered coal delivered at any point is regulated by the degree that the burner valve is opened.

In the Holbeck system, as we have said, the coal and air mixture not burned at the furnace is piped back to the return dust collector where it falls into the pulverized coal bin, thus keeping the powdered coal storage in motion. From this bin it is eventually again sent through the system. The return air together with any coal dust that did not settle in the dust collector goes to the intake pipe of the blower and is mixed with more coal and delivered again to the furnace. As both air and powdered coal travel in closed circuit this method is clean and economical of air.

The feed bin can be located at any convenient point and, in cases where there are a number of departments, it is the usual plan to place a feed bin so that each department will have its own circuit. Coal is usually placed in the feed bin by means of a blowing system similar to that of Quigley but differing from this in details.

(To be continued)

Northeast Pennsylvania Rock Crushers

THE extensive road work planned for northeastern Pennsylvania is developing a new industry in this part of the state, namely the opening and operation of stone crushing plants.

In addition to the one at White Haven, established for years, a new one has been started at the East End boulevard, near the point where the Hazleton road enters Ashley. The plant turns out 500 tons a day.

One is also being put into operation on the mountain above Mauch Chunk and the crushed stone will be dumped down chutes into cars at the base of the declevity.

The crusher at Pond Hill is another plant that has been enlarged and there is now one along the third rail system, near Nescopeck pass.

The road work around here is big enough in its scope ot keep these plants going for a number of years.—*Hazelton (Pa.) Sentinel.*

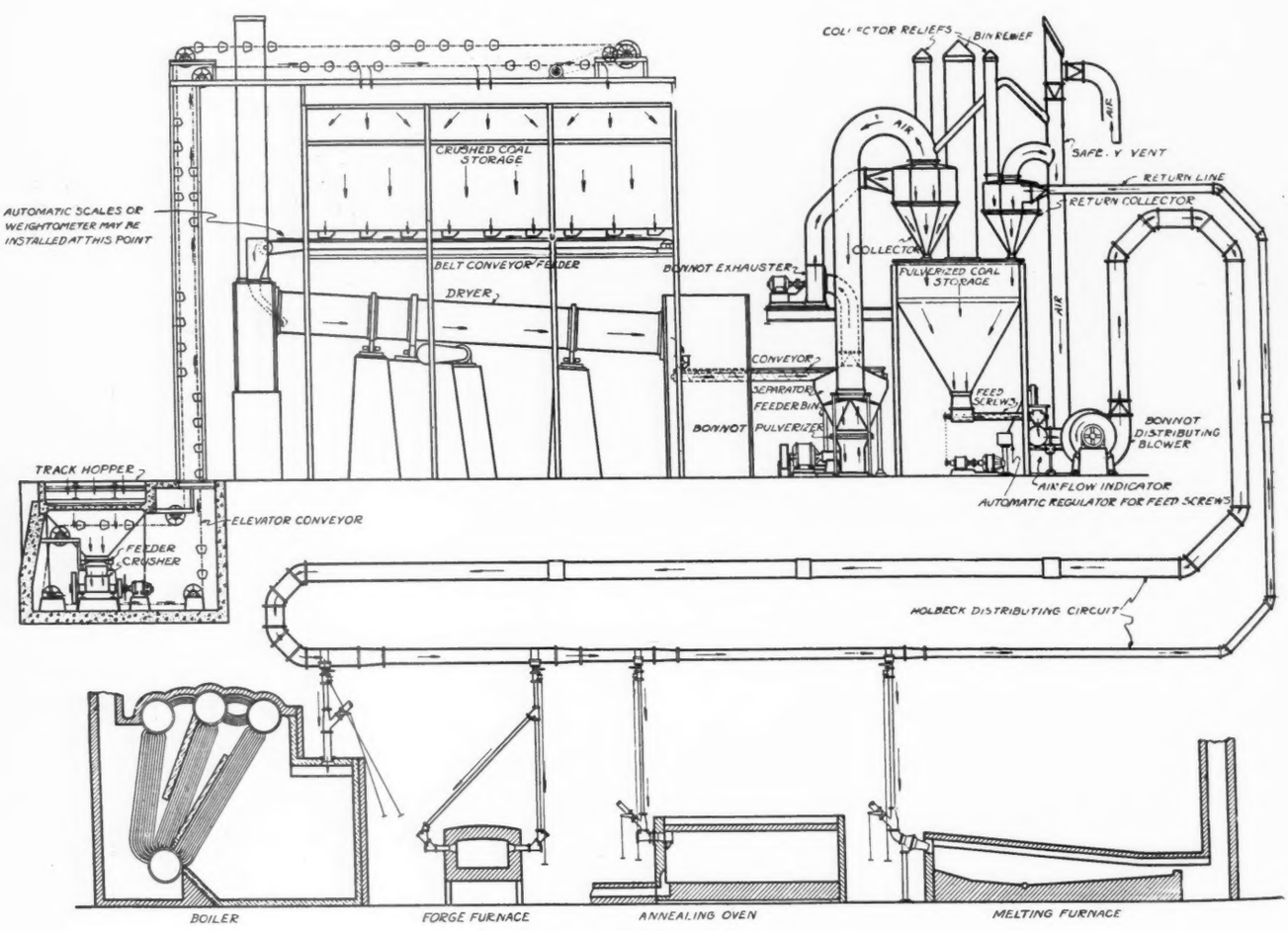


Fig. 38—Diagram of typical Holbeck system

"Grow or Go"*

Production Problems in the Lime Industry Need Co-operative Study

By Gordon Willis
President, Peerless White Lime Co., St. Louis, Mo.

THE subject selected for my paper was "Lime Plant Development." I was considerably puzzled in selecting the exact title until I glanced at a little slogan neatly framed that has been hanging in our private office for over 15 years and the problem was immediately solved. "Grow or Go" is my subject and I must tell you the origin of it.

At that time we had in our employ an Englishman, an Oxford graduate. He was a typical Englishman, as we Americans know them. In a discussion with me on matters pertaining to our business I made the remark, which was apropos, that a concern must "Grow or Go" by the wayside. The next morning this gentleman came into my office and his first explanation was, "Mr. Willis, I had a very wakeful night last night." I asked him why and his reply was, "In our discussion of yesterday you used an expression that kept me awake and appealed to me as being singularly applicable to the present business age. I refer to 'Grow or Go.' This is a modern adaptation of the old adage of the 'Survival of the Fittest.'" He suggested having the phrase framed and used as one of our slogans.

I want to impress upon all of you that "Grow or Go" will fit each case, be it individual, partnership or corporation. You cannot stand still, you must grow or you will go by the wayside. Our lime association is a most excellent example of the truth of this saying. We all know how rapidly the National Lime Association has advanced and increased in many ways the use of lime. I believe that the lime industry is still in its infancy and that another five years will show greater uses for lime than have been developed in the past five years.

Time for Study of Lime Production Problems

I am going to take the liberty of referring to a suggestion I have made before to this organization. We have various departments, viz., construction, chemical, agricultural, etc., and all have done most excellent work, but no consideration has as yet been given to a production department. The work of our technical men has been in the direction of sales, towards creatnig new uses for lime. Is it not a fact that but little, if any, attention has been given by the association to improving the purity, uniformity and quality of lime? I believe that this same condition applies to nearly all of the producers.

It might be claimed that lime being a cheap material cannot stand the added expense necessary to improve quality, but I am strongly opposed to this opinion. I believe that any material, be it lime, cement, plaster or any other building material, as well as all other products that are marketed, will attain an increased use and demand and at a price that will far more than offset any additional expense incurred in the improvement in quality if proper attention is given.

Gordon Willis

I have not the time now to elaborate on the benefits to be derived from a production department, but this is food for thought and I am confident that a thorough investigation of the subject will result in favorable action on the part of our association. I believe that a production department would show results not exceeded by any other department of the association.

Examples of Production Problems and Our Solutions of Them

Spalls have always been considered to a very large extent a waste product. We have given very careful consideration for some time past to the matter of disposing of the spalls so as to at least cover their cost of production. With this object in view we put into operation a few years ago a large Ruggles-Coles dryer, which has been operating constantly since it started. We supply the dryer with the spalls as they come from the mine. The spalls are reduced to 1-in. and under by a small crusher. The output shows less than 1% moisture remaining.

We have created a trade that takes care of almost the entire capacity of the dryer. We also have a market for our spalls as they come from the mine. Both of these outlets, however, have been sufficient to take care of only a small part of the spalls. About a year ago we made a thorough investigation of the matter of market for our spalls reduced to a fineness of 200-mesh and down. This investigation justified us in contracting for a fine grinding layout which is now being installed and will be in operation in a few weeks.

The investment is comparatively a large one and, of course, there is more or less of a gamble as to its success, but if we can obtain the market for the pulverized rock, as we now expect, it will with the other trade we have created take care of a very large part of our spalls, thus reducing our general cost of production.

If we are successful in marketing the spalls then we will, to a very large extent, eliminate waste. My hopes are that we will, in our humble way, be following the example of Mr. Armour, the eminent packer, who in describing the perfection of his plant stated that they were utilizing every part of the hog except the squeal, and they were at that time negotiating with the Victrola company to handle that.

Fuel Economies Possible

Another subject in the line of development that will no doubt be of interest to all the members is the matter of fuel consumption. We have always been impressed with the undoubted fact that there is a big waste of fuel in lime burning. About three years ago we went into this subject very thoroughly with the result

*From a paper before the National Lime Association, White Sulphur Springs, W. Va., May 21, 1924.

that we engaged the services of a combustion engineer.

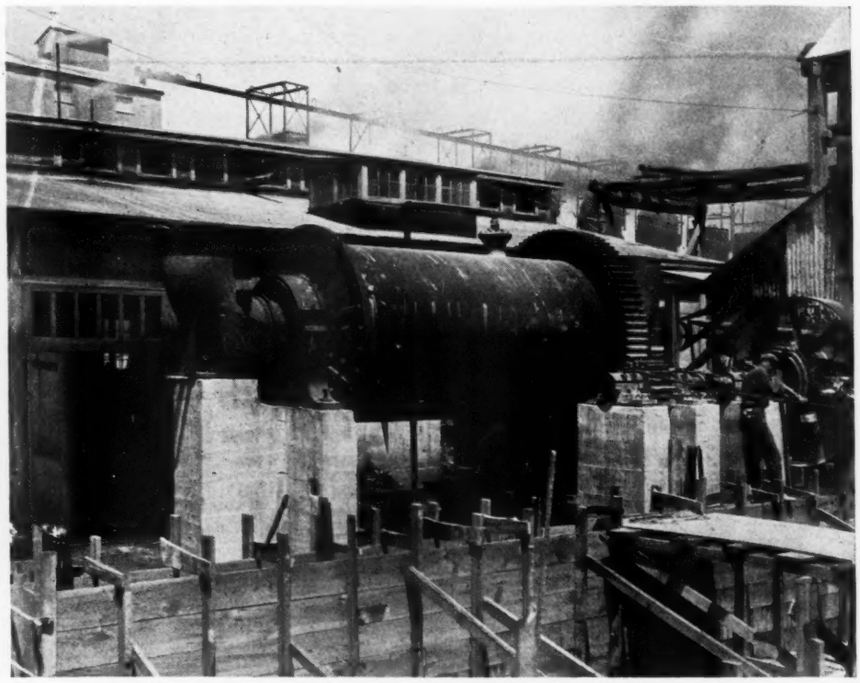
The production of our plant has increased and at the same time the fuel cost per ton of lime has decreased. In giving close study to combustion and fuel ratio production per kiln naturally enters into the proposition and as a consequence our kilns have increased in capacity from 15 to 20%. In other words we are getting from our kilns the equivalent to the production of more than one additional kiln simply by making a study of the kilns and getting as much lime as possible from each particular kiln. Numerous tests are made of each and every kiln from time to time. Close study is made and accurate records are kept. By changing firing periods, methods of firing, frequency of draws, etc., the fuel ratio has been increased very satisfactorily.

A plant may make a large amount of lime but that is no sign that it is efficiently operated. Capacity should be increased as should efficiency of equipment. Opportunities present themselves continuously to reduce labor costs, fuel costs, repair costs, etc. A company that "grows" grasps these opportunities. Such a company then has a tremendous advantage in the competitive field and the red on their books is conspicuous by its absence.

We have not yet reached our goal, but we feel we have made progressive strides and are surely approaching top efficiency. We will continue our efforts to increase fuel ratio, to improve quality and better kiln efficiency. We realize that we know very little from a scientific standpoint about a lime kiln and combustion problems and therefore continuous efforts will be made to better conditions and obtain all possible information.

Value of an Exchange of Ideas and Experience

I cannot refrain from expressing my opinion on the benefits derived from cooperation with those engaged in the same line of business. You all realize that it has only been within a period of a few



Kennedy-Van Saun air-swept tube mill installation for making 200-mesh limestone

Plant of the Peerless White Lime Co., St. Genevieve, Mo.

years that this idea has prevailed. There is hardly a day passes now but what one or more conventions or meetings of associations are held in our big cities. These meetings result in improvement in production and marketing of the commodity.

An industry or concern that is not willing to exchange ideas with its associate or competitive manufacturer is on the downward path and he will rapidly "Go" and not "Grow."

One of the most pleasant experiences that we have had was the totally unexpected visit to our plant not many months ago of a number of lime manufacturers. In several cases the chief officials of different companies were accompanied by their plant superintendents. All were cordially invited to make any inquiries they desired of our employes and we particularly stated that we wanted their criticisms even in preference to favorable comments. I do not hesitate to say that the visit of these gentlemen was not only exceedingly pleasing to us but also of mutual benefit in the exchange of ideas.

Statistics of the Sand-Lime Brick Industry

WASHINGTON, D. C.—The Department of Commerce announces that, according to reports for the Census of Manufacturers, 1923, the establishments engaged primarily in the manufacture of sand-lime brick in that year produced 187,025 thousands of brick, as compared with 93,005 thousands produced in 1921, the rates of increase being 101.1%. The value of the production in 1923 was $2,176,453, and in 1921, $1,214,678, an increase of 79.2%. The average value per thousand, however, decreased from $13.06 in 1921 to $11.63 in 1923.

The statistics for 1923 and 1921 are summarized in the following statement. The figures for 1923 are preliminary and subject to such corrections as may be found necessary upon further examination on the returns.

	1923	1921	Pct. of increase (a)
Number of establishments	28	26	.....
Persons engaged	623	438	42.2
Proprietors and firm members	1	3	.....
Salaried employes	106	61	.....
Wage earners (average number)	516	374	38.0
Maximum month	July 631	Oct. 477	.....
Minimum month	Feb. 377	Mar. 282	.....
Percent of maximum	67.4	59.1	.....
Salaries and wages	$856,987	$482,604	77.6
Salaries	$203,998	$121,422	68.0
Wages	$652,989	$361.182	80.8
Paid for contract work	$20,224	$10,538	91.9
Cost of materials	$847,014	$500,689	69.2
Products, total value	$2,202,762	$1,220,425	80.5
Sand-lime brick	$2,176,453	$1,214,678	79.2
Quantity (thousands)	187,025	93,005	101.1
Average value per thousand	$11.63	$13.06	.....
Other products	$26,309	$5,747	357.8
Value added by manufacturer (b)	$1,355,748	$719,736	88.4
Primary horsepower	4,060	(c)	.....
Coal consumed (tons of 2000 lb.)	26,016	(c)	.....

(a) Per cent omitted where base is less than 100. (b) Value of products less cost of materials. (c) Not reported.

Group Insurance of Cement Plant Employes

A BLANKET insurance policy covering illness or accident to any of its permanent employees has been taken out by the Marquette Cement Manufacturing Co., it has been announced by General Manager Cosford. More than 200 employes who have been with the company three months will be affected by the policy.

The insurance is free to the workmen and the premiums are paid by the company.

Under the provisions of the company's agreement, any employe, regardless of his compensation, will receive $15 per week in the case of illness or accident, this to run for the usual term of sick and accident policies. The agreement also provides that the employe need not be taken ill while at work, or be injured during his working hours. The plan, which is a new one for larger corporations, will provide an employe with funds during illness, which heretofore in most cases have been supplied by donations and subscriptions of fellow workmen.

The policy is being supplied by the company to cut down the costly turnover of employes, Mr. Cosford explained. "When a new man is taken on the job in a responsible position either in the plant or quarry, it takes several months to break him in and acquaint him with his work. We believe that the amount of money we pay out for insurance premiums on the men, will be more than re-paid in the reduction of the turnover of labor as fewer employes will quit. That is the plan on which we are working in arranging this insurance," he said. —*Cape Girardeau Missourian.*

Organization of British Rock Products Companies

IN THE United States, companies producing rock products (especially crushed stone and sand and gravel producers) have the stock closely held and the par value is usually $100, or else the shares are without par value. In Great Britain it appears that shares have a low par value which it is presumed means that they are open to popular subscription. Every newly incorporated company listed in the May issue of the *Stone Trades Journal* had a £1 par value for its shares. A sample notice (of a British sand company) follows:

British Sands, Ltd.—To carry on the business of quarry owners and mine owners. Nominal capital £3,000 in 3,000 shares of £1 each. Qualification of directors: £5. Directors: To be appointed by usual subscribers. Remuneration of directors: £100 each, Chairman, £150. Subscribers: Gladys Jones, 122, Seaforth Road, Seaforth, nr. Liverpool (typist), W. Swift, Windy Gap, Ewart Road, Seaforth (traveller).

New Cement Dust Collecing System

FOREIGN trade journals have notices of a new dust collecting system which employs electrified slabs of concrete instead of the tubes and wires of the Cottrell system so much used in the United States. One of these notices says:

The Oski system seems to be a very important invention as it greatly improves the conditions in which dust is collected, and is so economic that it is suitable even for treatment of dust and gases of small value. It is based upon the principle of *electrophoresis* and works as follows:

The dust is deposited on semi-conductive concrete slabs suspended on the path of the current of dust and which offer no resistance to the circulation of air. When a sufficient quantity of dust is collected on the slabs it falls automatically into the casing of a screw conveyor. These slabs do not cost much and, owing to the electric property of concrete, electricity is distributed evenly so that the consumption of current is only one-tenth of that required in the American system. By employment of transformers the voltage is reduced to 100,000 volts. The Oski device is utilized in the Alemannia Cement Works in Hover, near Hanover, Germany. Here 450 kg. of dust are collected per hour in treatment of 50,000 cubic meters of gases, for the same time.

These gases formerly discharged through the chimney are worth 1.50 mark per kilogram. The current consumption is 2.5 kw.

Taking the value as 5 marks per kilowatt the annual cost of current would be about 60,000 marks. Then, reckoning work at 16 hours per day, the value of the dust recovered in a year would represent more than 3,000,000 marks, all costs for plant repaid.

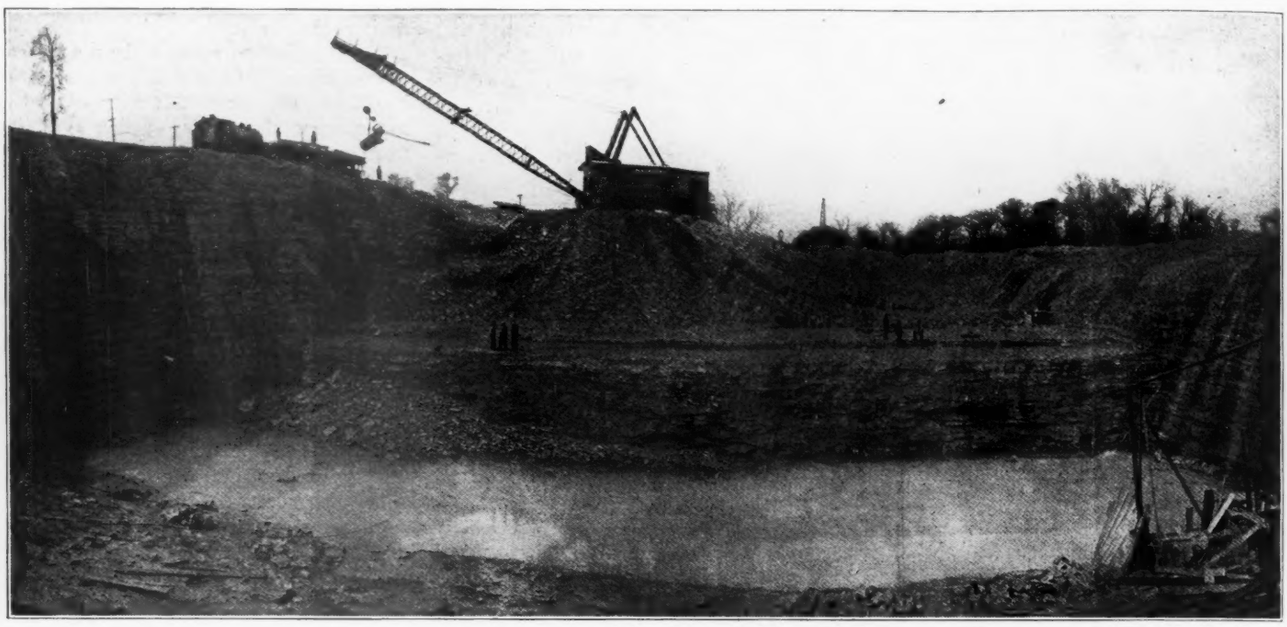
When a Quarry Is Not a Mine

PHOSPHATE rock when taken from quarries or open pits is not mined within the meaning of the state mine inspector law of 1915, and fertilizer companies are not subject to payment of mine inspection fees, according to an opinion handed down recently by Chancellor James B. Newman at Nashville, Tenn., in the case of Federal Chemical Co. et al. vs. George B. Thomason, state comptroller, et al.

The legislature of 1915 passed the law requiring that the state mine inspector inspect all mines, the owners to pay for such inspections. Phosphate rock quarries were not inspected under that law until 1920, when the first inspections were made and the owners charged with the usual inspection fees.

The suit in which Chancellor Newman filed his opinion was joined by the following companies: Armour Fertilizer Works, Federal Chemical Works, Hoover & Mason Phosphate Co., Charleston, S. C. Mining & Manufacturing Co., and the International Agricultural Corporation.

Hints and Helps for Superintendents



Dragline used for loading stone in Miami Conservancy operation

Dragline for Quarry Operation

DRAGLINES of the type illustrated have not infrequently been used for quarry stripping but their use for loading stone is unusual. It seems to be largely a matter of plant design, and the advantage, if any, to be gained by elevating the stone with the excavator over raising it with an inclined railway, elevator, or belt conveyor, is the factor to be considered. The use of a dragline permits the quarry transportation system to be kept off the quarry floor, which may have some advantages under certain conditions.

The view shown is one of the rock excavations on the Miami Conservancy District flood-prevention projects. We understand that one of the quarries at Hannibal, Mo., is, or has been, similarly operated. The Miami Conservancy District work was a temporary operation and has been completed.

In an article by C. W. Ullom, assistant engineer, Miami Conservancy District, on "An Economic Study of Dragline Excavator Operation," in *Engineering News-Record,* the following experience in rock handling is given: "In rock excavation most drag cables are broken prematurely by shocks or abrasion, and it seems most advisable to use cables of low purchase cost, commensurate with a reasonable degree of strength. The maximum yardage per cable in rock excavation was 17,000; the average 6,940 cu. yd. The cost of cable per 1,000 cu. yd. handled was $14.59 or approximately 1½ cents per yard."

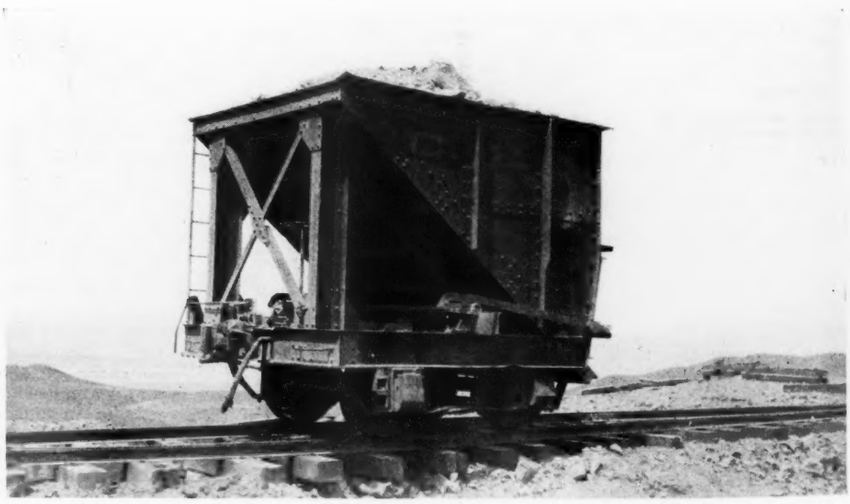
A Car That Builds Dump Without a Trestle

By A. O. CRUM
Sanderson Cyclone Drill Co.

THE car shown here is made and used by the Chile Exploration Co. in their copper mine at Chiquicamata, Chile, South America, for extending dumps without the use of timber which is both scarce and costly there.

As can be seen by the picture, the car is an old ore car cut off and a trap door fitted to operate by air pressure from the train line which dumps the rest of the train.

This car kept at the front end of the train and dumped at the rail ends advances the dump while the rest of the train is side dumped. No timber is buried or lost with this method.



This car is kept at the end of the train and is end-dumped while the other cars are side-dumped. In this way the dump is built ahead so that rails can be laid without a trestle and no timber is lost

Making Serviceable Water Tanks of Old Boilers

DISCARDED boilers may often be found about plants, especially where steam power has been superceded by electric power. They can sometimes be utilized either as air receivers or as water tanks. The picture shows a pair of old boilers which were made into serviceable water tanks at the quarry of the Stockbridge Stone Co., near Atlanta, Ga. The shells of the boiler were in fairly good condition, but the flues were badly rusted and of no value. The flues were taken out, but the flue sheet was left in place.

This flue sheet served as reinforcing for a concrete head which was made about 3 in. thick. Forms of rough boards were placed on either side of the flue sheet and the concrete rammed in between them.

Another old boiler on the plant was similarly treated with concrete and connected to the exhaust from the engine and steam driven compressor to serve as a water heater.

These are but two of many ways in which old boilers may be utilized. Others have already been shown in these pages and more will follow in coming issues.

How serviceable water tanks were made of old boilers. One of many uses to which old steam equipment may be put

A Dam That Lets Water Pass

AT the quarry of the Richardson Co. at Flex-Rite, Ga., the pumps had sufficient capacity to keep the quarry free from seepage and the water from ordinary rains. But heavy rains turned a little gulch above the quarry into a young river and poured a flood down the quarry wall that soon drowned the pumps.

To prevent flooding the pumps a dam of good sized stones was placed across the gulch. This was easy as slate quarries have plenty of waste to dispose of. There was no attempt made to keep the dam water-tight. On the contrary it was left as a porous structure through which the water would filter freely. The placing of this dam so retarded the flow into the quarry after heavy rains that the pumps were able to handle it. The reduction in volume is roughly estimated to be about 12% of the original flow after a heavy rain.

Dam of loose stones that allows water to pass slowly to prevent drowning of quarry pump

Pulling Rope for Locomotives to Use in Replacing Cars

BREAKING in or pounding down a new track over fresh fills and a soft roadbed with modern big equipment is conducive to numerous "spills," says *Engineering and Mining Journal*. If one is trying to keep a 300-ton shovel busy digging earth at the same time, something speedy is needed as a re-railing aid. The following method of using a pulling rope in conjunction with a re-railing frog was devised by George Leibig, pit foreman for the Cornwall Ore Bank Co., Cornwall, Pa.

The rope may be cut from old hoisting rope and should be about 1¼ in. in diameter and 25 ft. long. Tie or clamp one end of the rope to a hook and the other to a coupling link. If tied, the first pull of the locomotive will make a never-slip knot. It is also easier and quicker to re-tie the rope than to change cable clamps if a tear occurs.

The section ahead of a derailed truck is uncoupled and the link end of the rope attached to this. The hook is caught in the truck frame back of the journal box on the side which will draw the wheels to the track. After the wheels are pulled close to the rails, the replacing frogs are used along with the rope. The side pull of the rope on the truck crowds the wheels to the rails and counteracts the overturning effect of a loaded car on the frogs.

Warped A frogs can be used and need not be blocked up or fastened to the ties. With trucks askew of the track on an extra hard pull, a second engine to shove may avoid a possible tear in the rope and save time. Nearly any derailed car can be quickly replaced without unloading and with little damage to the track. Where a piece of track is giving trouble, the ropes are carried on the locomotives, and only 15 or 20 minutes are required as a rule for jobs that formerly took one-half to three hours.

A Blasting Problem—and Its Various Solutions

Wilsons (N. Z.) Portland Cement, Limited, Presents Problem; American Experts Suggest Solutions

THE following quarry-operating problem was submitted to the editors of ROCK PRODUCTS by F. N. Rhodes, assistant works manager, Wilsons (New Zealand) Portland Cement Ltd. The editors in turn submitted it to various American quarry experts who have been good enough to answer it in considerable detail.

Of course, the actual solution of such an operating problem could not be undertaken without an inspection of the quarry itself. Nevertheless, the problem as presented brings out certain fundamentals, which every quarryman must contend with at some time or other; and a thorough discussion of these by such nationally known experts as we have had discuss the problem makes an exceedingly interesting and attractive presentation of quarry practice.

The Problem

"A tracing showing the general contours of the quarry tract and the development work to date is attached.

"The output now required is 500 tons per day, but the demand will shortly rise to 900 tons and the quarry will have to be developed to supply 1300 tons per day within three years.

"The rock is an argillaceous limestone with a general strike N25 deg E and dipping 18 deg. to N.W., but in addition to fairly distinct lamination and joint planes, numerous faults are present. These combined make it inadvisable to work a quarry "with the lay of the ground" when the face is high and vertical. The rock is considerably softer and weaker than the Lehigh Valley cement rock and breaks readily.

"Until recently a blast-hole drill was used in the "old cut" and a vertical face some 200 ft. long and running from 100 ft. to 160 ft. high was developed. This is indicated on the tracing as "edge of old cut." On account of the construction of a government railway, which it became necessary to cross below grade, the quarry and floor had to be lowered, the portion marked "floor of new cut" shows the progress of the work to date.

"The overburden on the whole is light, but a heavier deposit on the left-hand side at the entrance to the quarry initially discouraged work in this direction. On the other side the presence of the stream prevents extension. The result is the high and short face indicated as "edge of old cut." The heavier overburden referred to, while inconvenient is not sufficient to discount any scheme of development calling for extension in that direction.

Editors' Note

WE published this problem—without solutions—in our May 31 issue. It was done, we must admit, largely by accident; but it was subsequently hoped that some American quarrymen would volunteer solutions. Maybe you are still mulling it over. Anyhow, we had several good solutions in hand, all the time, and we present them herewith.

We believe discussions, pro and con, of such specific problems as here presented have considerable value. We are certainly under obligations to our good friends for their interest and assistance in helping us present these particular ones. It is not expected that these discussions will close the subject. We want to hear from others both as regards the original problem and the suggested solutions.—The Editors.

Cement works and township, Portland, New Zealand

Cement rock quarry, showing position of 100,000-ton blast—face 160 ft. high

"At present, steam shovels, ¾-yd. and 2¼-yd. dipper capacity, are installed together with a Loomis "Clipper" blast-hole drill and the usual jackhammers and compressor.

"The problems before us are:

"1. Length of face required to enable 1300 tons per day to be loaded regularly. The deposit extends at least 1500 ft. to the left and back into the hill a similar distance.

"2. Best direction in which to extend the quarry, keeping in mind that due to height and small tonnage, the face advances slowly and giving consideration to loading and transportation track requirements.

"3. Best method of working quarry while providing safe working conditions for shovel and train crews. Assume face at least 200 ft. high. Should present method with well-drill holes be extended, or should some method of tunnel blasting be adopted?

"Our inclination is to maintain for the present the vertical face, possibly using somewhat more explosive than the most economical blasting practice indicates; but sufficient to throw the apex of the broken pile away from the face and produce reasonably safe working conditions. Due to the short face, it is felt that it would be difficult at present to maintain the supply of rock by means of tunnel blasts, but it has been suggested that this method could be utilized to extend the quarry face to the left, leaving the final squaring down to be done with jackhammers."

Wrong First Attack

By L. C. BONNELL,
Secretary and Treasurer, Commonwealth Quarry Co., Summit, N. J.

There are many conditions in connection with an operation like this which would be considered by one on the ground, but are not discernable at this somewhat remote distance and must perforce be ignored.

This case is, to my mind, another instance of the direct and inevitable result of a wrong first attack, and it would appear—from a broad viewpoint—necessary to rectify the mistake with as economical a method as possible.

First: It is true that the length of face to produce a given tonnage per day may be reduced as height increases and it would be safe to say that 1300 tons per day could be expected from a face running from 100 to 200 ft. high and 500 ft. long.

We are told that this production must be attained in three years with production during that time of 900 t. p. d.

We find on investigation that the extension of the new floor to the old line of face will yield something like 175,000 tons which should be easily available at 500 to 600 t. p. d. and we aim for an additional 300 to 400 t. p. d. while developing not less than 500 ft. of north to south face for future use.

Second: We are called upon for 300 to 400 t. p. d. from development work.

With an eye to ultimate economy and uniform production I would advise against tunnel blasting on south side of new cut, on account of danger of interrupting traffic to mill and would make the new attack 150 ft. wide centering about 225 ft. from south side of new cut and at same level, and drive this as a through-cut say 200 ft. west. This area would yield something over 200,000 tons of rock, available regularly at from 300 to 500 t. p. d. with shots "cushioned" or shot "against the bank" to protect tracks and avoid interruptions.

Maximum tonnage should always be taken from this development and it should reach the desired point in two years.

The dike remaining between the two floors should now be attacked and removed, producing something like 100,000 tons.

We have now joined the two workings, the new development has produced approximately 300,000 tons and to complete the job has taken about two and one-half years. We also have the advantage of two entrances to the quarry, often a great help in transportation. Not having any data as to the depth of overburden, I have figured the development area as all rock and tonnage assumed would be reduced by stripping and time shortened accordingly.

We now have the old face at the new

level about 200 ft. long, the new north to south face about 250 ft. long, and an east to west face 200 ft. long, which it would seem safest and best to work by tunnel method under the existing rock formation.

This latter face should be persistently worked to the south and additional north to south faces put into production as fast as they are exposed to a length of say 150 ft., thus giving a series of steps to the face to be worked alternately.

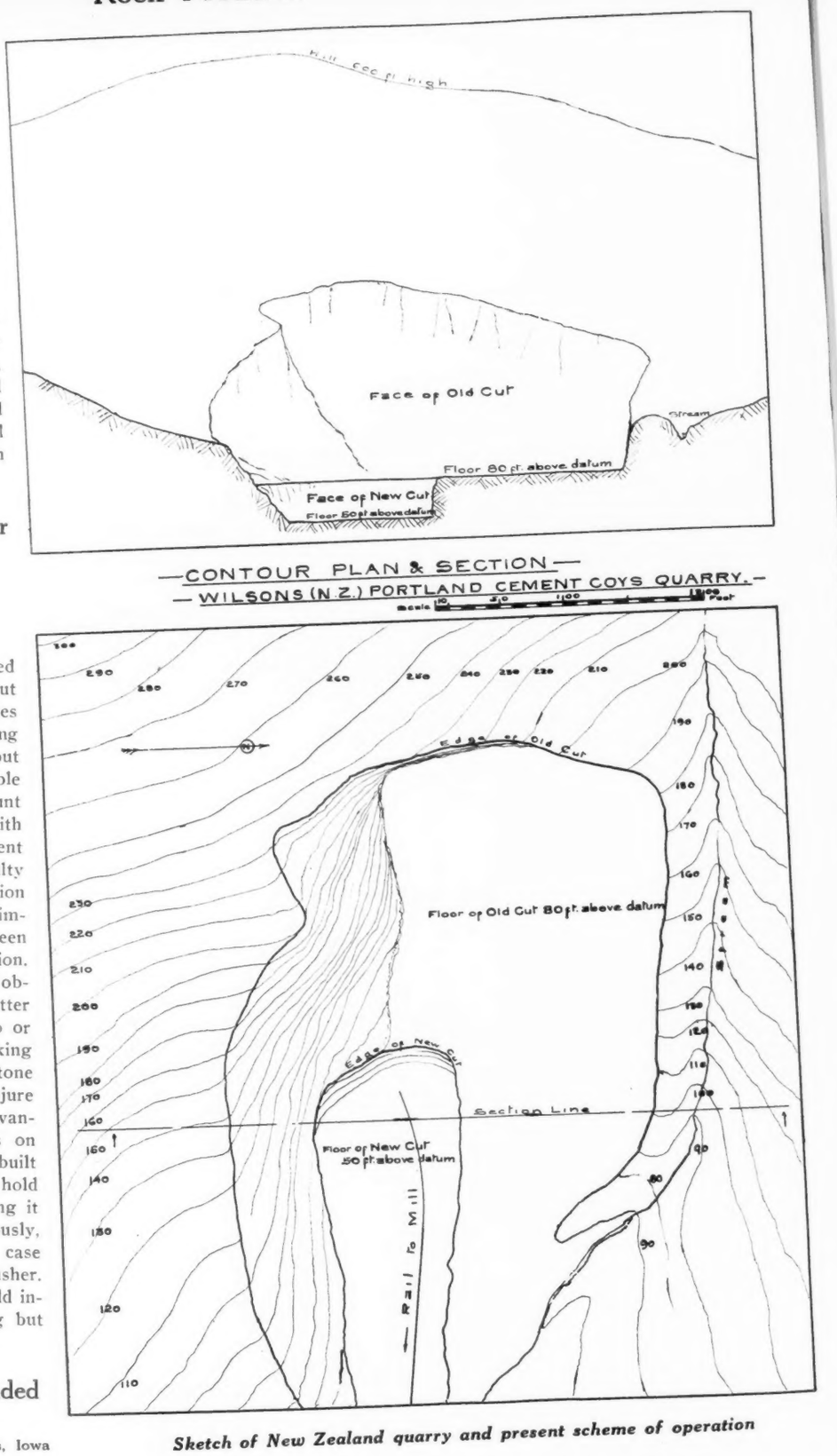
Third: I believe in the blast-hole drill for this work except as mentioned for the ultimate extension of quarry to the south, but if the face is developed as suggested the tunnel method may be substituted later with the advantage of unhindered tunnel entrance at the north end of each step.

Face of 200 Feet Too High for One Level Operation

By THOMAS SULLIVAN,
General Manager, National Stone Co., Omaha, Neb.

Referring to the sketch, the line marked "Edge of new cut" shows the new cut to be about 275 ft. long. A row of holes drilled 20 ft. back from face would bring down 275 ft. by 30 ft. by 20 ft. or about 13,000 tons of stone. It should be possible to load from this the maximum amount of stone required (1300 tons per day) with the 2¼-yd. and ¾-yd. shovels the cement company now has, without any difficulty whatever, providing their transportation system is adequate. Of course some impediments may exist that have not been mentioned in outline of the proposition.

From some experience and general observation I judge it would be much better to quarry a ledge 200 ft. high in two or three benches in order to avoid working shovels against high masses of loose stone that would be liable to fall and injure men and machinery. It is also advantageous to have the haulage tracks on high levels as long chutes can be built to the crusher. These chutes would hold a large quantity of stone, thus making it possible to feed crushers continuously, rather than intermittently as is the case when stone is dumped direct into crusher. The two or three-bench method would involve building an overhead crossing but the benefit may be worth the cost.


Face of Old Cut
Stream
Floor 80 ft. above datum
Face of New Cut
Floor 50 ft. above datum
CONTOUR PLAN & SECTION
WILSONS (N.Z.) PORTLAND CEMENT COYS QUARRY.
Edge of Old Cut
Floor of Old Cut 80 ft. above datum
Edge of New Cut
Section Line
Floor of New Cut 50 ft. above datum
Rail to Mill

Sketch of New Zealand quarry and present scheme of operation

Tunnel Method Recommended

By R. N. VAN WINKLE,
Consulting Quarry Expert, Cedar Rapids, Iowa

It is somewhat difficult with the limited data furnished by Mr. Rhodes to form a detailed and comprehensive mental picture of the quarry layout and operations in question, and while the problems involved are of sufficient interest and magnitude to warrant first-hand investigation by ones' being personally on the property. This is somewhat remote in this particular case owing to the fact of the quarry being located in New Zealand. Therefore, recommendations and discussion will be made purely from the data furnished and interpreted by the writer.

So far no serious mistakes are evidenced in the opening up of this quarry, unless it might have been possible to have relocated the stream on the north side and opened the quarry by taking circular

cuts east and west. This proceedure is even yet worthy of consideration by the men in charge and on the ground. Mr. Rhodes is to be complimented by attempting at this time to find a solution for his future operating problems by taking them up far enough in advance to have sufficient time for study, discussion and a solution before they become embarrasing and a source of added expense and curtailed production.

The statement is made that owing to the construction of a government railway it became necessary to cross this railroad below grade and therefore the quarry floor had to be lowered to an elevation of 50 ft. above datum. While the location of this government railroad is not shown on the map, it is assumed that the railroad is at some point east of the quarry workings and at a great enough distance to in no way interfere with the operations of the quarry proper. It is to be regretted that the quarry floor had to be lowered 30 ft., as the lowering of the floor merely adds an additional 30 ft. burden to the working face when the quarry is worked back to the edge of the old cut.

Such a quarry layout as is here presented offers divers methods of development, but with the information at hand the writer is of the opinion that the present railroad to the mill should be swung to the south as far as is practicable and the south one-half of the old quarry worked out to the depth of the floor of the new cut. This would make available in round figures approximately 140,000 tons of stone which would be ample to maintain a daily production of 900 tons for 155 working days, or almost a year. While the south one-half of the old quarry is thus being worked, and work should begin as near the east entrance as possible it then looks advisable to do what stripping is found necessary on the top of the south and west sides of the high bank, and immediately when the stone loading operations have progressed in the south half far enough west to permit starting a tunnel in the south bank, this should be done and the tunnel method of blasting resorted to. When the south one-half of the old quarry has been worked out to the elevation of the floor of the new cut swing the track to the mill to the north and work out the north one-half, which operation will consume ample time and develop sufficient tonnage to enable the high bank to the south and west to be stripped, tunneled and prepared for shooting.

Present blast hole drill equipment can be very advantageously used in quarrying the 30-ft. face in the old quarry, but to enlarge the quarry the tunnel method of shooting is recommended and the tunnel method can be developed while working out the bottom 30 ft. of the old quarry as outlined above.

As the writer sees it there is only one direction in which to expand or enlarge and that is to the south and at the same time working to the west, unless it would be possible, as previously mentioned to move or relocate the stream at the north side of the quarry and real consideration should be given this if there is the slightest possibility of this stream at any time overflowing into the quarry workings. A stream too near a quarry is always sooner or later a menace especially where heavy shooting is practiced and the elevation of the stream bed is above the quarry floor.

There are still other methods which might be considered and worked out; the mining method or removing the stone from the top in lifts using a tramway for letting the stone down the side of the hill, but taking everything into consideration working the quarry as outlined above and using the tunnel method of shooting will be the simplest and most economical, would provide the safest working conditions for the shovel crews and train operations and would provide ample tonnage and ample time to make the change in operating methods.

In conclusion it is only fair to say that none of us is infallible and the above recommendations and suggestions are made by what might be termed "A long distance observer," and while they may not fit the actual conditions in any respect it is hoped that my suggestions and opinions will open up new angles of thought to those men actually in charge of the operations and the men on the job.

Blast-Hole Drilling Method Recommended for Limestone

By S. R. RUSSELL,
Technical Representative, E. I. du Pont de Nemours & Co., Wilmington, Del.

It is rather difficult from this distance to state definitely the best method to pursue in developing this quarry. There is nothing like a personal examination and study. However, from my understanding of the situation after a study of the sketch, I would be inclined to favor recommending the blast-hole system of drilling and blasting rather than the tunnel method. I believe in limestone of this nature that the blast hole method would be both more efficient and economical than tunneling. My experience has been that tunnel blasting in limestone where there are open free joint planes and faults usually produces excessively large stone, and the occurrence of mud seams or caves, which is always likely in this formation, is detrimental to the system. I feel that tunnel blasting is best suited in rocks where the cost of drilling is prohibitive, such as traps and granites, or to overcome an excessive toe or other special emergencies. Since January 1, I have laid out nine tunnel blasts in different operations, four of which were in limestone and five in trap, and I must say that the results in the trap were far better than in the limestone.

In order to assure a 1300-ton daily output from a quarry, the length of the face required would depend somewhat on the height of the face. If the face is 200 ft. high, the holes could be spaced say 18 or 20 ft. apart and up to 30 ft. or more back, which would mean a tonnage of about 45 tons per foot of hole, or 9000 tons per hole. Now, as far as the volume is concerned, a face of say 200 ft. would be ample, but in order to facilitate the movement of shovels and proper layout of track, I would say that the minimum length of face with standard gauge tracks would be 450 ft.—with a narrow gauge, possibly 350 ft. would do. This would give room for a circular main loading track, avoiding too sharp curves, with ample room for shovels of the type and size now in use. The whole face could be shot down at one time and while it is being cleaned up, the next line of holes could be under way. When one shot is loaded out the next could be fired immediately, causing no serious delay in output. The longer length of face would also give some opportunity to prepare the stone from the shot a sufficient distance ahead of the shovel, thus eliminating some delays from large stone. It may, of course, be better to have a longer face than this, and to do so I would recommend extending the quarry to the south and west, in spite of the fact that the overburden is heavy at that point.

I wonder if this company ever considered working this stone as an underground mine. It might be possible to develop the deposit to the north even under the bed of the stream by this method. There seems to be about 50 ft. of stone between the bed of the stream and the floor grade of the "new cut." Thirty feet of this could be mined, leaving 20 ft. for capping or if necessary they could drop 10 or 20 ft. lower and mine out from 40 to 50 ft. of stone with a 20-ft. cap. Also to the south and west large portals could be driven into the face, thus doing away with stripping. Whether or not mining could be carried out successfully here would depend greatly upon the nature and lay of the rock. We have many successful underground limestone mines in this country and the cost, all things considered, compares very favorably with open-pit quarries.

Several Feasible Solutions

By J. BARAB,
Hercules Powder Co., Wilmington, Del.

I have carefully considered the information given in Mr. Rhodes' letter and in a general way I feel that Mr. Rhodes has

made several suggestions which would satisfactorily answer his problem. The adoption of any method of operation would be the result to a greater or lessor extent of personal preference and an intimate knowledge of local conditions. My reply to the specific questions must necessarily be considered merely as suggestions of a general nature on account of lack of information of the many local conditions which might influence the selection of the best method of operation. The specific replies to the direct questions asked are as follows:

1. When two steam shovels are operating, sufficient space should be allowed between them at all times to permit each shovel to operate freely without interference from the other shovel. This refers to easy access to the rock and uninterrupted train service. Within limits, the greater the length of working face the better. With the high face present in this case, the length of the working face should be at least 500 ft. The height of broken rock should be sufficient not to require many moves of the shovel per day and 1300 tons per day can be produced by two shovels within a 500 ft. working face. My preference however would be to extend the face to a length of a thousand feet or more.

2. The logical direction for extending the quarry face appears to be in the left-hand direction. Since you state that although the heavy overburden lies in this direction, it is not sufficient to discount any scheme of development called for extension in that direction, I would recommend extending the face in this direction for the following reasons:

a. The length of face can readily be extended and while doing so the left-hand side will act as the face.

b. The loading track and the transportation in general will be greatly simplified.

c. Extension to the right-hand side does not seem feasible on account of the stream.

d. Advancing westward will not readily increase the length of the quarry face.

3. Having a face 200 ft. in height, a material which readily breaks into satisfactory handling size and a formation dipping at an 18 deg. angle from the burden, I would suggest using the tunnel method of blasting. Of course it is true, as stated by Mr. Rhodes, that a vertical face would not readily be maintained if the tunnel method were adopted. However, this can be supplemented by well-drill holes drilled to a depth of about half the height of the face and blasted at the same time the tunnel shot is made. This should help maintain a vertical face. By shooting fairly heavy, the material can be thrown out satisfactorily so as to maintain a safe working face and the rock can be broken up very well. Since I previously suggested advancing to the left-hand side, the problem of length of working face is eliminated, because the entire left-hand side will be part of the working face.

After the quarry face has been extended to a satisfactory length, the most convenient method of blasting should be a combination tunnel and well drill hole method, unless some local condition should make this scheme inadvisable. One big advantage of such a scheme is that by giving careful attention in laying out and supervising the blast the required tonnage is obtained for a long period of time. After the blast is made the supervisor is free to attend to other duties for some time to come.

Work Quarry to Left with Blast-Hole Drills

By J. REYNARD,
Loomis Machine Co., Tiffin, Ohio

The first mentioned 1300 tons of stone per day required could be produced from a face 600 ft. long by 200 ft. deep by drilling six holes to the shot (more holes if possible), requiring 30 days to drill the six holes, producing 57,000 tons of stone per shot which would run your mill 44 days.

As to direction: you would work the quarry to the left, making the face semicircular and extending to the right toward the stream as far as possible, and as expedient as possible, making shots which will give more track to work on and which will not increase the height of the face so fast.

As to best method: Use a 7-in. well-drill hole for blasting down to 150 ft. in depth spaced, say, 20 ft. centers, and below the 150 ft. depth use an 8-in. hole to 250 ft. depth, spacing these holes 25 ft. from the face and 25 ft. apart, being careful in starting to rather reduce this spacing, then work out to the maximum of spacing efficiency rather than to get the holes slightly too far apart at first and produce rock that is not readily handled.

Use a bulky powder which will come well up in the hole and which will throw the stone well out from the face and eliminate the piling of the shot stone against the face, this method of procedure will throw stone 250 ft. to 300 ft. from the face and will give six to seven tons of stone per pound of powder. Would recommend a long face, as straight as it is possible to secure, to work to.

Some quarries have been using from 6-in. to 8-in. holes with excellent results. The 7-in. holes 75 ft. deep give fine shooting effect in stratified limestone.

Drilling with well drills gives much better results than tunneling. It will throw stone out further and will give better fracture of the stone, and is more economical.

I have seen tunneling which often leaves a hump or toe unless the drift is well below the quarry floor, in which latter case a waste of powder is evident in shooting stone you do not use. Would recommend you maintain the vertical face.

After inspecting a piece of your rock I would say that in this stone you should drill 30 to 40 ft. of 8-in. hole in 10 hours.

An Outline of Plan for Several Years' Development

By M. B. GARBER,
Sanderson-Cyclone Drill Co., Orrville, Ohio

The following suggestion is rather elaborate and is one that will take a number of years to develop in its entirety but which, if followed, would supply ample stone at all times for the cement mill during this period of development.

This plan calls for an ultimate quarry layout worked by the big blast hole or well drill method on several benches ranging from 50 to 60 ft. high and in order to do this it is necessary to start towards the top of the hill and work down. The plan is divided into three stages of development as follows:

First: For immediate needs.

Second: To supply stone for increased production for a period of two to four years.

Third: For an ultimate or final quarry layout with a working face of several benches, each ranging from 1200 to 1500 ft. long.

For Immediate Needs

For the immediate requirements of the mill, the new 30-ft. cut on the old quarry floor should be continued by the present method of operation. It is assumed that the well drill is being used for that. The toe to the left or the south side of the present quarry should be taken up with jackhammers or piston drills and the quarry face straightened along that side as much as possible to prepare for well-drill operation. Approximately 200,000 tons of material can be secured in taking up the 30 ft. of bottom and in the toe. When this is completed, it will permit the working of a perpendicular quarry face by the well-drill method from the present northwest corner around along the west and south sides of the quarry.

Second Stage of Development

The second stage would call for the working of a high face by the well drill system, starting, as stated above, at the present northwest corner of the quarry with a row of holes around the west and south sides to a point approximately where the 100 or 110 ft. contour line intersects with the south side of the quarry face. This would give a perpendicular face ranging from 50 to 200 ft. in height and about 700 ft. long. A well drill could be drilling these holes while the floor is being lowered and the toe being removed in the first stage of development.

Two cuts 30 ft. wide should be made this way, the holes spaced approximately 30 ft. back from the ledge and from 20 to 24 ft. apart, depending on the height of the face, with the explosive charge broken so as to distribute it in the bore of the hole with a portion towards the top. This will throw the stone low enough to be safely handled with a steam shovel. On the south side near the quarry entrance where the face is lower than 100 ft., the spacing will necessarily need to be smaller than mentioned. The full width of the cut can be taken care of by extra shots or by a double row of holes.

The two cuts as described above will produce well over 600,000 tons of material which will take care of the increased capacity of the plant at 900 tons for about three years or at 1300 tons for over two years.

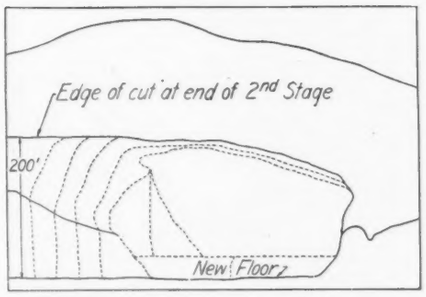
Two such cuts having been made, the quarry face in the southwest corner will begin to rise over 200 ft. in height, a somewhat greater height than can be handled economically or safely by the well drill method. After these two cuts have been taken down, several straight cuts should be made along the south side of the quarry, carrying them west until they intersect with the 250-ft. contour line, at which point the face reaches a height of 200 ft. The number of such straight cuts would depend on how the contour of the hill runs to the left or south which is not shown on the sketch submitted.

Third Stage of Development

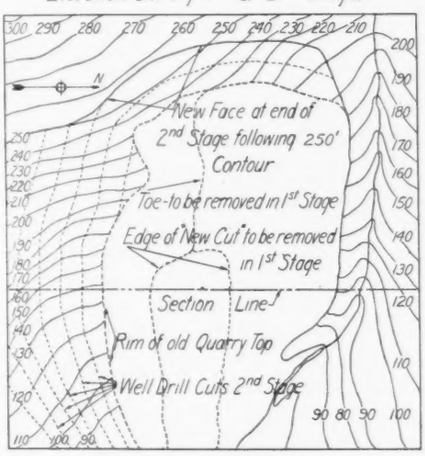
While the deep well-drill cuts are being made along the south and west sides, the work for the final or ultimate development of the quarry should be started and well under way. Briefly stated, this consists of getting on top and working down.

On the right of the quarry entrance or rather along the north side of the quarry, no development work can be done due to the presence of the stream. There is a ridge there approximately 50 ft. wide between the stream and the edge of the cut, 25 ft. of which can be leveled off enough to provide for an incline to the top of the hill and allowing room for a double track to be operated by a suitable hoist or perhaps later by locomotives after the hill is cut back and the grade reduced. Such an incline or track system will never tie up any working face.

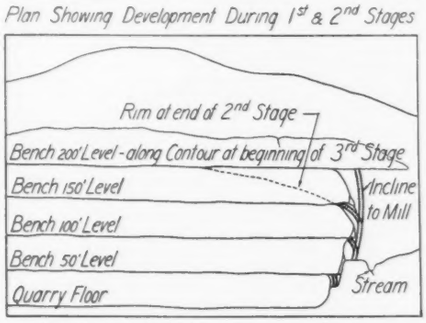
About half way up the hill a new bench should be opened with the working floor on the 250-ft. level or even higher. However, the previous deep cuts of the second stage of development will have carried the quarry back so that the 250-ft. contour forms the rim of the ledge, making a good place to break in for a bench floor. The cut should be started on the northwest corner of the quarry top. As the contours here are further apart, the face of this new cut will not rise so fast and



Elevation During 1st & 2nd Stages


New Face at end of 2nd Stage following 250' Contour
Toe to be removed in 1st Stage
Edge of New Cut to be removed in 1st Stage
Section Line
Rim of old Quarry Top
Well Drill Cuts 2nd Stage

Plan Showing Development During 1st & 2nd Stages


Rim at end of 2nd Stage
Bench 200' Level - along Contour at beginning of 3rd Stage
Bench 150' Level
Bench 100' Level
Bench 50' Level
Quarry Floor
Incline to Mill
Stream

Elevation - Bench Development 3rd Stage

M. B. Garber's solution of the quarry opening and operating problem

for a time the blast holes will be shallow so that the drilling can be best done with jackhammers or piston drills and the well drill substituted as the face becomes higher. This face should be started wide enough for the shovels and loading tracks. The first blasts along the rim of this new bench cut will throw a great deal of material down on the old quarry floor.

After this top bench is worked back from 60 to 100 ft., another bench can be started about 50 or 60 ft. below and then later another one about the same distance below until a series of benches approximately 50 ft. in height have been developed. Although it is not possible to tell from the drawing submitted just how long these benches could be made, it is probable that it would be possible to extend them 1200 to 1500 ft. in length which would give an enormous amount of working face of a height that can be most economically handled, considering all quarry operations, namely, drilling and blasting, shovel operation, etc., as it is generally admitted that a face from 45 to 60 ft. in height gives the most economical all around results. Each of the working benches can be reached by a switch-off in the main incline and later perhaps by a more independent track layout. Operations on each bench may be carried on independently. This, of course, will solve the quarry problem for years to come.

This may seem to be a very elaborate scheme but it can be developed over a period of years and the cost so distributed it would not be noticed as would be the case if a more radical method were to be adopted. It disregards the structure of the rock to a certain extent, especially the dip, as in no place would the formation dip away from the face, which is always a disadvantage in well-drill shooting. As the contours run northwest and southeast and the bench working faces would follow them in the beginning, it would seem then that the maximum advantage would be taken of the desirable portion of the deposit which, it is stated, extends 1500 ft. to the south and 1500 ft. back into the hill.

Sales Letters on Trap Rock

THE North Jersey Quarry Co., Morristown, N. J., is getting out a series of sales letters which constitutes a noteworthy promotional effort on the part of a quarry products manufacturer. The letters are 4-pp. folders, the first page of which is a type-written letter.

The facing middle pages contain tables of approximate quantities and weights of trap rock which we reproduce herewith:

APPROXIMATE QUANTITIES OF EACH SIZE OF STONE OUT OF 1000 TONS OF NORMAL CRUSHING

	Per cent	Tons
2½-in. Trap Rock	40	400
1½-in. Trap Rock	30	300
¾-in. Trap Rock	15	150
½-in. Trap Rock	10	100
Dust	5	50

CERTIFIED WEIGHTS OF TRAP ROCK

	Lb. per cu. yd.
2½-in. Trap Rock	2578
1½-in. Trap Rock	2460
1½-in. and ¾-in. Trap Rock	2564
¾-in. Trap Rock	2303
½-in. Trap Rock	2279
Dust	2518
1½-in. St. Con. Gravel	2600
¾-in. St. Hwy.	2804

The opposite page carries a different sales argument each time. No. 1 letter, dated May 15, has for its subject, "Trap Rock, Its Great Resistance to Wear." The No. 2 letter dated June 11 is on "Trap rock has qualities which make the life of an asphalt pavement longer and stronger." Letter No. 3, dated June 24, is entitled "Trap rock makes the best mineral aggregate for asphaltic concrete."

The fourth and last page of each letter carries a map of the trap-rock deposits of New Jersey and the railway lines which tap them.

I. W. Wortman, secretary of the company, is the author.

Modern Methods and Processes of Mining and Refining Gypsum*

Part II.—Crushing, Rock Storage and Drying

By Alva Warren Tyler

A PRECEDING article (in the June 14 issue) sketched in a general way the size and remarkable growth of the gypsum products industry of the United States. It also covered quite comprehensively the winning of the raw gypsum rock from the earth by mining and quarrying. We now come to the beginning of the manufacturing operation proper, which is crushing the raw gypsum rock.

Crushing

From the weighing hoppers referred to in Article I the rock is delivered to the primary crusher or breaker, where it receives its initial reduction. In modern mine operations this preliminary reduction is taken care of by gyratory or special rotary crushers, the latter being a development by the larger gypsum companies themselves. The gyratory (Fig. 1) is a very satisfactory crusher for gypsum, as a comparatively large capacity is available at low horsepower and small maintenance cost. A machine of this type crushing to 3½ in. has a capacity of 90 tons per hour and requires a 40-hp. motor to operate.

Fig. 1—Modern gyratory crusher being installed as initial breaker at gypsum plant

The rotary crusher (Fig. 2) referred to above has the advantage of a much greater ratio of reduction than the gyratory; taking the same size rock, it may be adjusted by merely turning a hand wheel to give a product all passing a ⅝- to ¾-in. ring. The power requirement is, of course, considerably greater for this reduction. With the same ratio of reduction, however, and for a given capacity there is little difference in the horsepower required by these two types of machines on this class of rock. The rotary type, as developed by gypsum manufacturers, has a capacity of 150 tons per hour when delivering 3-in. rock and requires approximately 75 hp. for the operation. On gypsum this machine is very satisfactory and the maintenance cost is low besides having also a low first cost. A rotary machine of the above capacity and privately built will cost less than a standard gyratory of only 90 tons per hour capacity.

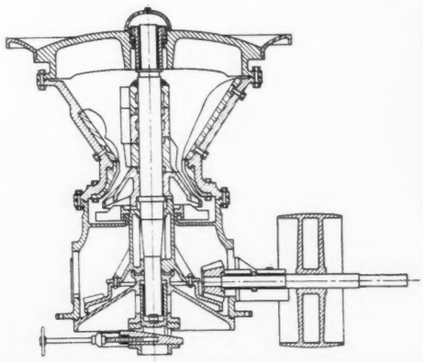


Fig. 2—Specially designed rotary crusher for gypsum rock

The jaw breaker (Fig. 3) is probably the simplest initial crushing device and lowest in first cost and horsepower and is desirable where too great a ratio of reduction is not required. For quarry work where steam shovel loading is employed and consequently close sizing is not required, this type of crusher is the most economical to use since in the larger sizes it will take 16 to 20-in. rock and quickly reduce it to a size easily handled by secondary crushers.

Earlier practice placed the secondary crusher immediately following the primary but the development of the outside rock storage has made it highly advisable, if not absolutely necessary, to place the secondary crusher after the storage pile; in fact, it is becoming common practice to place it immediately following the dryer. The reason for this is obvious since rock too finely crushed does not handle readily, the finer material packing and cementing the coarser particles until, after standing in the pile for a short time, it requires constant attention to keep the material flowing to the feeders. Nor does finer rock work well in the dryer as, of course, it carries an excess of fines which stick to the shell. There is also the danger of much greater dust loss unless extra precaution is taken for its collection.

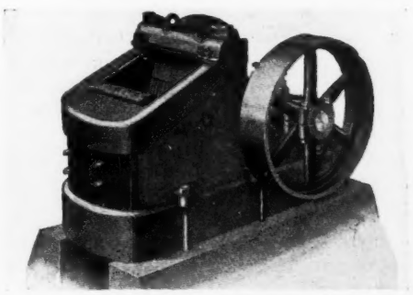


Fig. 3—Modern jaw crusher used as a primary breaker

A good size of rock for storing runs from 2½ to 3½ in., which is also a very economical size to handle in and from the primary crusher.

Another type of primary crusher which is apparently coming into favor in the gypsum field is the single roll crusher, Figs. 3a and 3b. Its simplicity makes it at once attractive both from the viewpoint of operation and maintenance. In the larger sizes it is capable of handling steam-shovel-size rock and reducing to 3 to 3½-in. ring.

The roll crusher is inherently self-feeding and requires practically no attendance—at the same time giving a capacity at least as great for the same ratio of reduction as some of the other more familiarly known types.

Its recent use by some of the larger gypsum concerns gives the single-roll crusher

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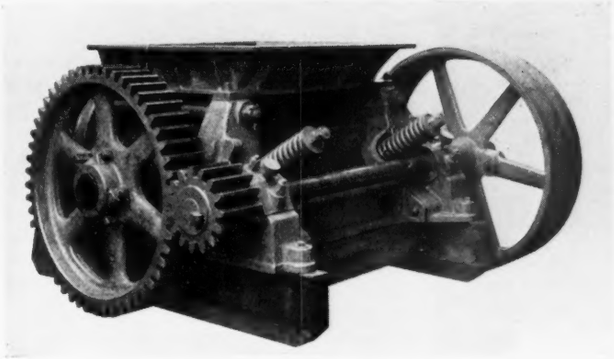


Fig. 3a—Large-size single-roll crusher

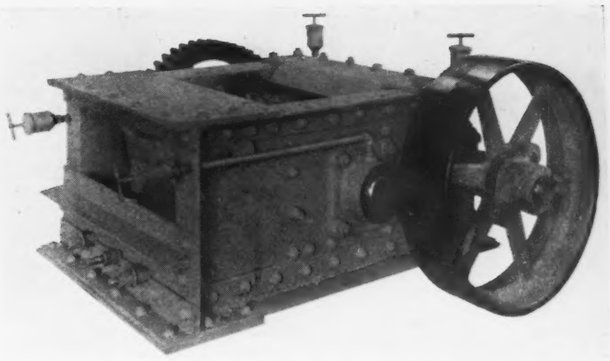


Fig. 3b—Smaller size of modern single-roll crusher

official recognizance in this particular field and it is anticipated that it will increase in favor as it becomes better known.

Rock Storing

It has become the general practice the last few years, not only to have active rock storage bins of camparatively large capacity (Fig. 4), but also to have an outside rock storage in order to properly balance the mining operation with the mill operation, since it has proven most economical and otherwise advisable to operate the mine on a single shift while the mill is operated 24 hours per day. Also during the winter months the demand for gypsum products is much less than for the summer months. Through the medium of the outside rock storage a uniform mining operation can be continued throughout the year; the excess mine capacity during the winter being utilized to replenish the storage while during the summer the peak demands are drawn from this stock pile, thus requiring no variation in mine conditions whatever.

The schemes for storing the rock outside vary somewhat according to the opinions of various designers and also they depend on the local conditions. A very successful method of storing outside, used by one of the larger gypsum companies, is that of arranging belt conveyors in such a manner that the rock may be delivered from the crushers, either to the large active storage bin or to the outside storage, as desired. The outside storage system consists of a long belt conveyor extending for some distance out on a high trestle (Fig. 5) and discharging by an automatic tripper at any point throughout the length of this trestle. This allows the rock to pyramid from the ground below to the point of discharge above, the height of which, of course, depends on the height of the trestle. Where local conditions permit a loading track along this trestle, green rock shipments may be loaded by means of a chute directly from the discharge of the tripper. The author recently made an installation according to this design having a capacity of 30,000 tons and costing approximately $15,000. The cost of storing by this system is about 1.4 cents per ton.

The rock in this storage is reclaimed by means of another belt which is located in a long underground tunnel (Figs. 6 and 7) directly beneath the pile and below the delivering belt on the trestle above. It will be seen, of course, that only a certain percentage of the rock will automatically flow by gravity to this reclaiming conveyor. Inasmuch as the outside rock storage is to provide a flexible link between the mine and the mill it is seldom necessary to reclaim all of the rock contained therein. In the case of emergency, such as a strike in the mine or other trouble causing a shut-down of the mine covering considerable period of time, it would be necessary to reclaim the total volume of rock, in which case a drag scraper would have to be used on that portion of the pile which does not naturally gravitate to the conveyor below. The cost of reclaiming that portion of the pile not requiring the use of the drag scraper would be about 1.64 cents per ton. Neither of the above figures include interest or depreciation.

Another system adopted by one of the larger concerns is that of having an outside storage pile to which the rock is both delivered and reclaimed by means of a drag scraper. This system has the advantage of a very low first cost, due to the fact that

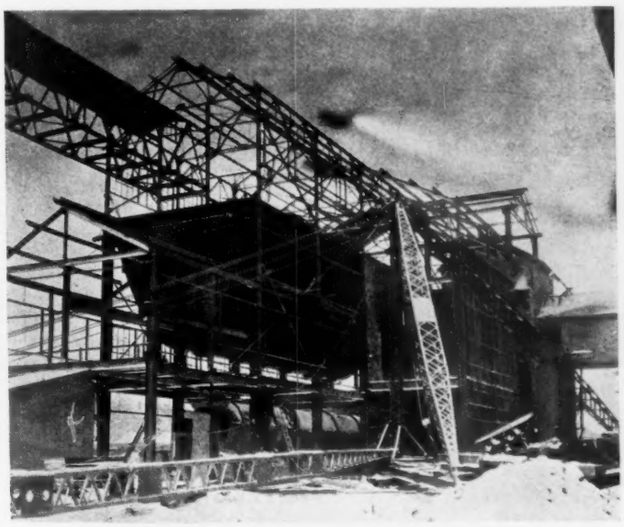


Fig. 4—A 100-ton storage bin for gypsum rock under construction; the dryer is directy below bin and is thus automaticaly fed from the bin

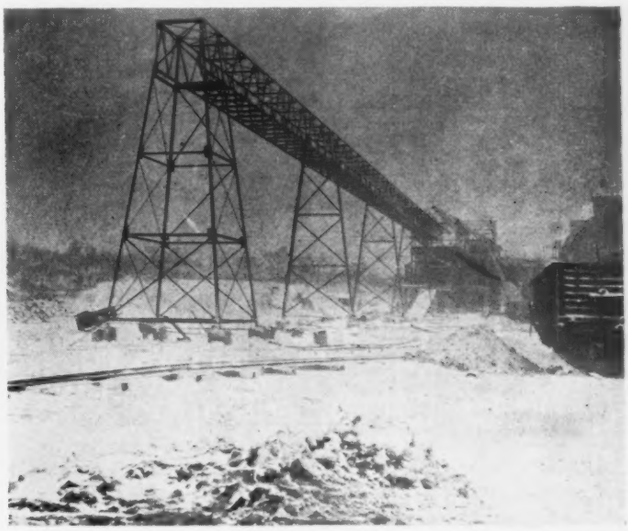


Fig. 5—Provision for gypsum rock storage—a 350-ft. trestle with ground space for 15,000 to 18,000 tons of crushed gypsum rock

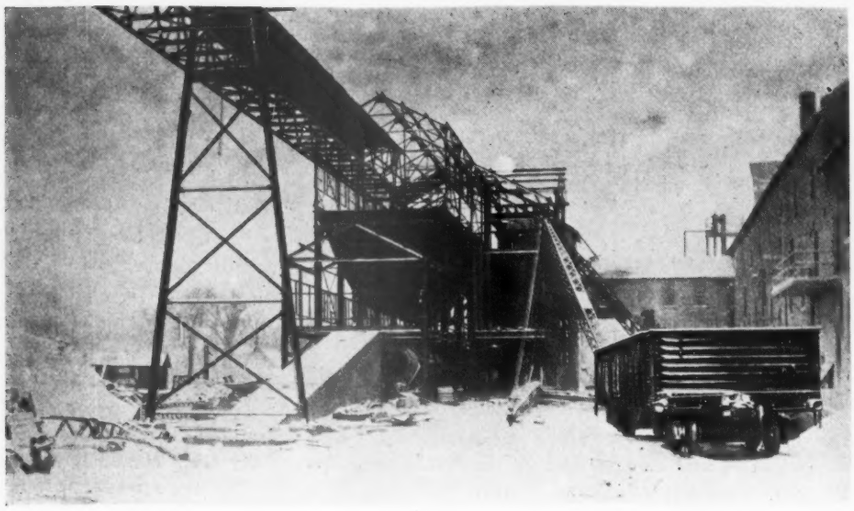


Fig. 6—Mill end of ground storage equipment; the outlet tunnel emerges directly below trestle at end of bins

Fig. 7—Concrete reclaiming tunnel for trestle ground storage

neither the high trestle work nor the underground tunnel is required, and also, if sufficient space is available, a given quantity of rock may be located more closely to the point where it is required when reclaimed. Two operators, however, are required for both storing and reclaiming the rock, whereas in the first case but one is required and that for reclaiming only.

The active storage bin spoken of above, which receives the rock from the primary crushers, in modern installations, serves a double purpose; that of supplying the rock to the mill or of supplying rock directly to cars for green rock shipments. In either case automatic feeders are installed at the bottom of this bin which regulate the supply of either mill or cars.

Drying

Assuming that we are delivering the rock to the mill, the next step is the process of drying the rock. The rock is delivered usually from the automatic feeders to a belt conveyor which carries it to the dryer. The modern dryer is of the horizontal cylindrical rotating type which carries the rock continuously from the intake to the discharge end during which period it comes in contact with direct heat from a coke or oil furnace (Fig. 8).

The size of the dryer most often used in modern gypsum plants is 6 ft. in diameter and approximately 40 ft. long. The capacity of a unit of this size is about 50 tons per hour. In connection with the dryer is the dust handling equipment, as, of course, it will be seen, a larger quantity of dust is not only produced in the rock during the process of crushing, but more is also formed during the process of drying. A large percentage of this is very readily picked up by the circulation of air necessary to draw the hot gases through the dryer.

A very satisfactory dust-collecting arrangement is obtained by building a long narrow chamber containing a series of baffle walls over and under which the dust ladened air is carried. The area of the cross section of this chamber, of course, is necessarily much greater than the area of the cross section of the dryer itself, thus allowing the velocity of the gases to be greatly reduced and consequently the depositing of the dust within the chamber. A conveyor for the continual removing of dust is placed in the bottom of the chamber so that the capacity of the chamber remains approximately constant. The dust from this dust-collecting system is delivered to the elevator receiving the discharge from the secondary crusher referred to above.

Secondary Crushing

It has been previously mentioned that the secondary crusher in present practice comes after the dryer; in fact, in recent installations it is placed so that the dryer discharges directly into the secondary crusher. One of the most successful types of secondary crushers for gypsum is the hammer mill (Figs. 9 and 9a) which serves the double purpose of

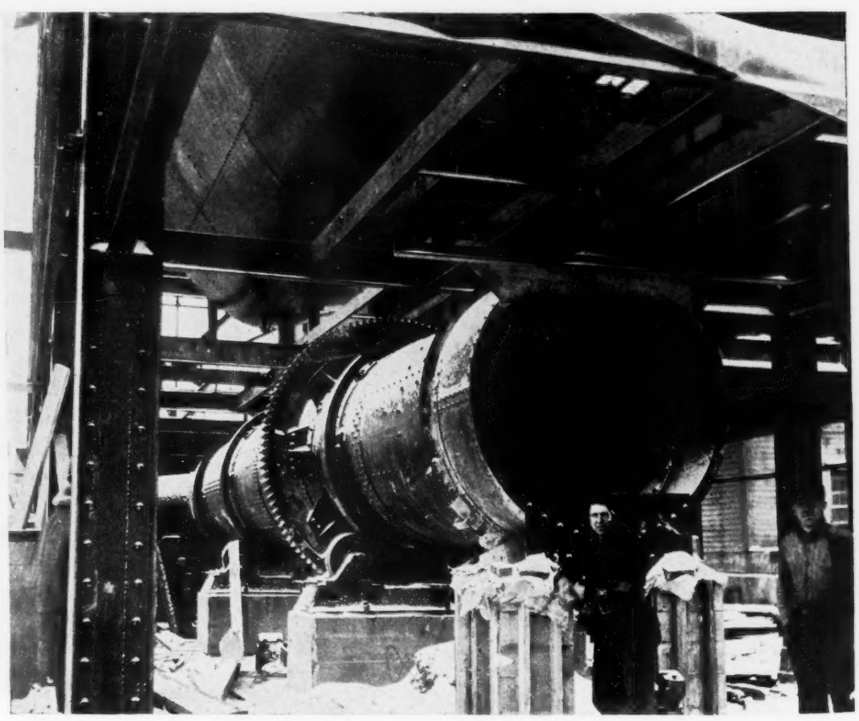


Fig. 8—Furnace end of gypsum rock dryer before the furnace was built. This dryer is 6x40 ft. built according to company's own design and specifications

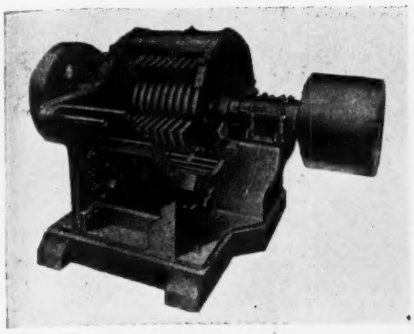


Fig. 9—The hammer mill is much used for a secondary crusher

a secondary crusher and preliminary grinder. A properly selected hammer mill will take from 2½ to 3½-in. rock and, with a capacity of 50 tons per hour produce (depending on the quality of the rock and condition of the mill) from 25 to 40% fines passing a 100-mesh screen, and the total output passing a ½-in. ring. This capacity requires not over a 75-hp. motor.

It would take from six to ten horizontal mill stones to produce this same quantity of fine grinding and at more than double the expenditure of power.

From the secondary crusher or grinder the rock is elevated and delivered to the crushed-rock bin ready to be further reduced by the grinding machinery. With a pulverizer installation, as outlined above, a screening system should be employed. Electric vibrating screens have proved very successful for this work, as have also air separators. Either equipment would be placed at the head of the elevator receiving the dry rock from the pulverizer, the fines bypassing the grinding machinery and the oversize being discharged into the grinding bin.

(Screening, air separating, grinding and calcining will be treated in the next article.)

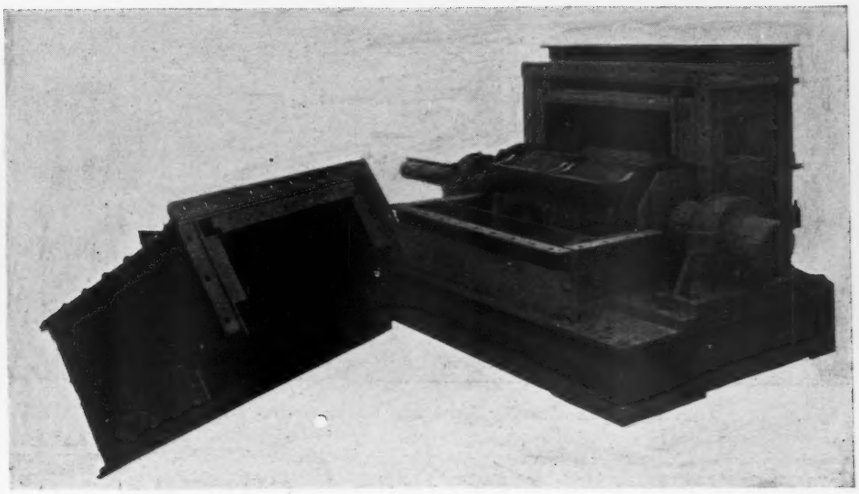


Fig. 9b—A modern type of hammer mill

Gypsum Produced in 1923

THE Department of the Interior issues the following preliminary statement, compiled by the Geological Survey, which gives the essential details of the gypsum industry in 1923. The total quantity of gypsum mined in 1923 was 4,753,448 short tons and exceeded that of 1922 by 973,499 tons or 26%. The total value of sales of both crude and calcined gypsum was $34,888,155, an increase of $5,527,004, or 19%.

GYPSUM PRODUCED AND SOLD IN THE UNITED STATES, 1923, BY STATES

	Number of active plants reporting	Total quantity mined (short tons)	Sold without calcining: Agricultural gypsum Short tons	Agricultural gypsum Value	For portland cement, paint and other purposes Short tons	For portland cement, paint and other purposes Value	Sold calcined: Short tons	Sold calcined: Value	Total value
California	3	111,832	2,865	$21,796	(*)	(*)	24,936	$374,040	$670,495
Iowa	7	685,041	329	1,961	134,566	$383,322	431,829	4,983,249	5,368,532
Kansas	3	135,019	(*)	(*)	54,021	141,961	71,349	700,490	842,740
Michigan	6	586,987	616	3,465	135,000	351,602	341,746	2,897,926	3,252,993
Nevada	4	298,390	(*)	(*)	(*)	(*)	226,753	1,891,639	1,952,007
New York	8	1,361,116	1,249	5,906	228,831	712,093	823,241	9,626,746	10,344,745
Ohio	3	526,861	(*)	(*)	17,563	55,014	432,511	4,919,375	4,981,542
Oklahoma	4	290,121	.....	.....	47,041	125,182	202,323	2,123,713	2,248,895
Texas	4	344,104	.....	.....	.....	.....	254,512	2,177,983	2,237,024
Utah	3	44,531	(*)	(*)	(*)	(*)	33,520	269,148	286,957
Wyoming	4	.....	.....	.....	.....	.....	27,945	176,791	176,791
Other States†	16	335,802	‡20,367	‡116,898	‡204,794	‡658,236	230,713	2,169,619	2,525,434
Total	65	4,753,448	25,426	$150,026	821,816	$2,427,410	3,101,378	$32,310,719	$34,888,155

* Included under "Other States."
† Alaska, Colorado, Montana, Oregon, South Dakota, Virginia and New Mexico.
‡ This figure includes also output of states entered as "(*)" above.

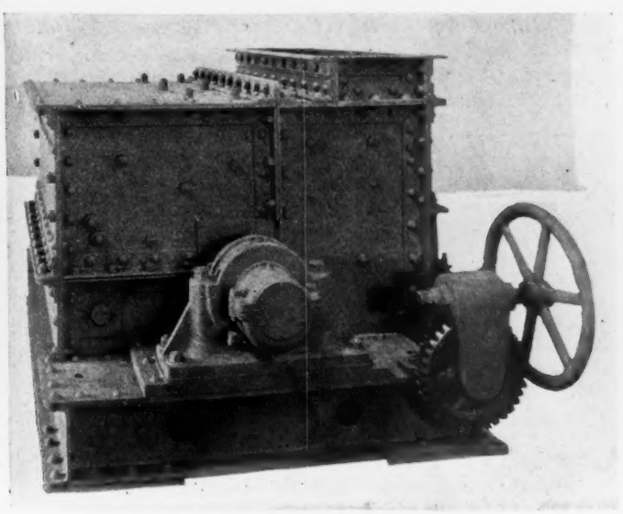


Fig. 9a—Large-size hammer mill capable of reducing one-man stone to ½-in. in one operation

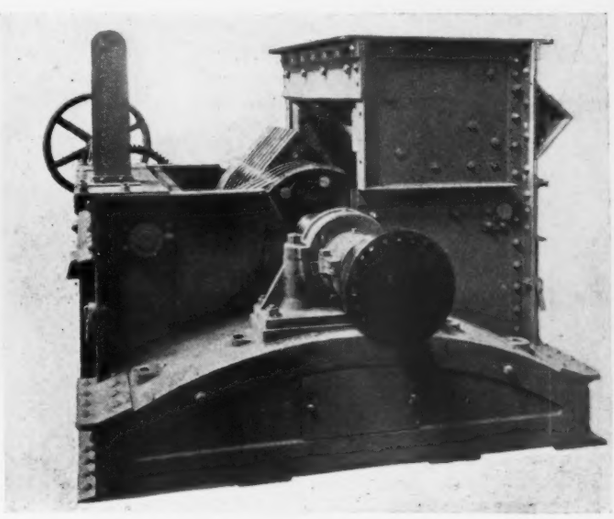
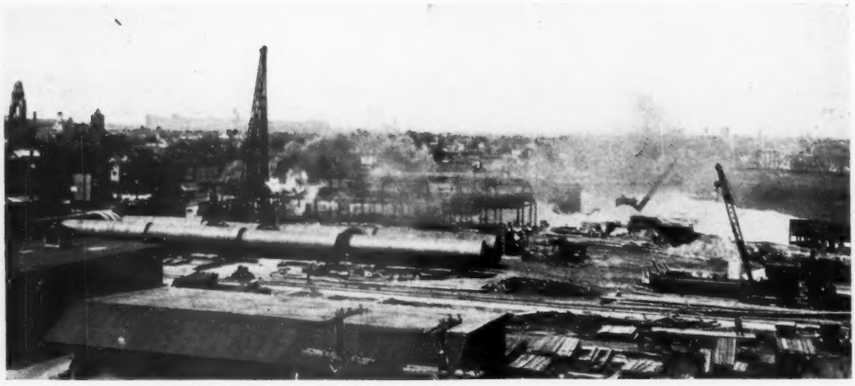


Fig. 9a—Same crusher with covering removed showing type of hammers used and method of mounting



Looking north showing kilns and shops in the background

The River Rouge showing work un concrete d northea

Progress on Peerless Cement Plant

New Wet-Process Plant of the Peerless Portland Cement Company, Detroit, Michigin, Is Rapidly Taking on Form—To Have Many Unusual Features

By George M. Earnshaw
Central Representative, Rock Products

TWO MONTHS ago construction was begun on a 4500-bbl. cement plant at Detroit by the Peerless Portland Cement Co. Officials expect to produce clinker in the early winter and to have the plant, in its entirety, completed in time to take care of the heavy spring demands.

The Peerless company has owned and operated a 2000-bbl. wet-process plant at Union City, Mich., for the past 26 years, and through its experience in operating this plant, the advantage is afforded of being able to build a second plant that will be as nearly perfect as possible.

The best part of all, about the plant, is its location. Only 4½ miles from the heart of downtown Detroit, it is located on the west bank of River Rouge, on a triangular plot of 14 acres, bounded on the other two sides by Jefferson avenue and the Michigan Central railway tracks. All of its boundary lines, therefore, are avenues of outlet for cement. Although the company estimates that 90% of the output will be shipped by motor truck, to be used within the city, sight is not lost of the fact that there is a market to be reached both by rail and water.

Coal and Limestone Received by Water

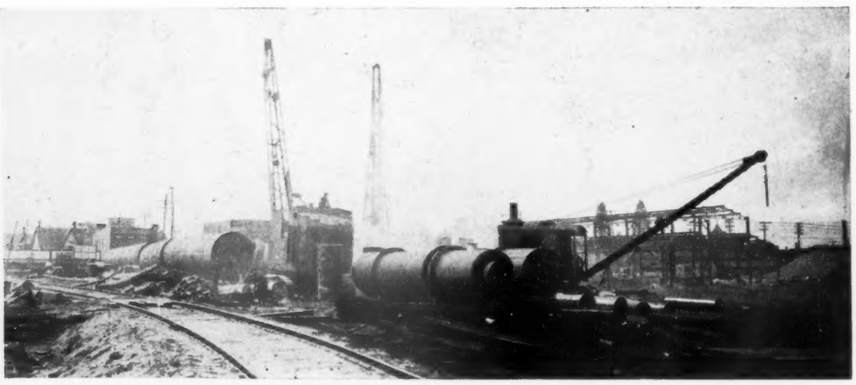
Work is nearing completion on a 800-ft. dock, of concrete construction. The river channel here will be dredged to a depth of 23 ft., so that the largest boats can dock, unloading coal and stone. The stone will be brought from Rogers City, Mich., and will be unloaded into a receiving hopper. From the hopper the stone will be carried by a 54-in. belt conveyor to storage in the heart of the plant. The storage will be 550 ft. long, 172 ft. wide, the belt conveyor running its full length down the center. On either side there will be an 80-ft. span, Whiting electric overhead traveling crane, equipped with a 3-yd. clamshell bucket. As the plant will have no crushing machinery (the stone being screenings from crushed stone plants) the cranes will move the stone directly from storage to the raw grinding department. The stone storage will have a capacity of 150,000 tons.

Adjoining, and parallel to, the stone storage will be the clinker and coal storage. It will be the same length as the stone storage but only 80 ft. wide; half of it will be for clinker and the other half for coal. One crane will operate its full length, handling both products. This storage will accommodate 100,000 bbl. of clinker and 17,500 tons of coal. An interesting feature of the storage system is that it will be possible to use the stone storage for clinker storage. That is, as the stone is removed, during slack seasons, a cross conveyor can move the clinker into the stone storage until it is entirely filled, if necessary. This means a possible storage for 600,000 bbl. of clinker.

To Store 30,000 Tons of Clay Under Roof

Clay will be obtained on the outskirts of the city and will come in by rail. Storage for it is entirely removed from other storages, there being provided a structural steel and concrete building, 80x500 ft., having a capacity of 30,000 tons, into which railway cars can be moved and unloaded by a crane identical to those in the stone storage.

At one end of the clay storage building will be the clay-mixing tanks. From them the clay slurry will be pumped by a 3-in. vertical pump to the large mixing tanks near the raw grinding mills. Raw grinding will be done by three 7x26-ft. Traylor compartment mills, driven by 500 hp. Ridgway synchronous motors with 60-in. Cutler-Hammer magnetic clutches. From these mills the material will be pumped to the mixing tanks by a 6-in. horizontal pump. The slurry will move by gravity from the mixing tanks to a correcting basin and from there it will be pumped to three large storage tanks underneath the kilns, by a 6-in. vertical pump. From the storage tanks it will be pumped by a 5-in. pump into a rectangular,



In the foreground are the kilns and dryers. The machine shop is at the right

...showing ...ork under way on reinforced ...oncrete ... northeasterly

Southern limit of the waterfront property showing site of railway tracks in the foreground over which clay from local sources will be received

troughed-bottom, steel tank mounted over the feed end of the kilns. The feed into the kilns will be regulated by nozzles rather than the more common method of ferris-wheel feed. Regulation is afforded by simply changing nozzles; there being 12 different sizes of nozzles, selection of the proper size to use will depend upon condition of slurry. All pumps used in the handling of slurry, will be furnished by the Morris Machine Works, Baldwinsville, N. Y. There will be two pumps at each pumping point, one of which will be an auxiliary.

The Traylor kilns are of the two-tyre type, having the same diameter (11 ft.) their full length of 175 ft. Two of them are already on the ground and the third is on its way. They will be driven by 100-hp. motors and will be fired with pulverized coal and will discharge into a pan conveyor leading to storage.

Pulverized Coal Plant

Coal will be pulverized by two Raymond "Monarch" mills of the latest type. These will be equipped with a full dust-collecting system. Drying will be accompanied by two class A-10 Ruggles-Coles dryers. From the coal plant the pulverized coal will be moved to the storage bins over the kilns by two 8-in. Fuller-Kinyon pumps through 450 ft. of 5-in. line.

The finish grinding plant will consist of three 8x26-ft. Traylor compartment mills, each driven by a 650-hp. Ridgway synchronous motor with a 66-in. Cutler-Hammer magnetic clutch. The object in having 8x26-ft. mills in the finish plant and 7x26-ft. mills in the raw plant is to enable the plant as a whole to quickly respond to a heavy demand for the finished product, it being reckoned that, due to slack periods, the smaller size mills in the raw-grinding plant will be capable of keeping a surplus of clinker in storage in normal times.

Special Provision for Truck Loading

The finished cement will be moved by spiral conveyors and tightly encased elevators to 8 silo storage tanks having a combined capacity of 200,000 bbl. From them it will be removed by underground conveyors to either of two packing houses, one having four 3-tube Bates packers and the other, three packers. The latter will be used exclusively for the truck trade, although the other also is arranged so that its output can be diverted to trucks. The finish plant, warehouse and packing houses will be equipped with Sly dust-collecting systems.

The waste-heat boilers are of the vertical type, three in number, 1000-hp. each. A 500-hp. auxiliary boiler, fed with pulverized coal and good for 200% of its rating, is installed for standby purposes only. All are made by the Geo. T. Ladd Co., Pittsburgh, Pa. The power plant will be comprised of two 3000-kva. Ridgway turbo-alternating units, generating at 2300 volts; two 150-k.w. direct current auxiliary units for supplying d. c. service about the plant wherever needed and for the excitation of the four synchronous motors; two Elliott surface condensers used in connection with the turbo units. Transmission lines of the Detroit Edison Co. will be run into the plant so that outside power will be immediately available in case of an emergency. All motors above 20-hp. will operate on 2200-volt current, while all under 20-hp. will operate on 440-volt.

At the time of the writer's visit the structural steel work of the machine shop building was almost completed. It will serve not only as a machine shop, but also as a blacksmith shop, carpenter shop, tool room and storeroom. It is 48 ft. wide by 180 ft. long and will be provided with a 5-ton, overhead traveling crane. This building, like all others comprising the plant, will have a cement-tile roof, Gunite walls and steel sash. All buildings will be heated by steam transmitted at a moderate pressure from the waste heat boilers.

All foundations and buildings are being put up by Henry L. Vander Horst, general contractor, Detroit; the piling and dredging by the Candler Dredge & Dock Co., Detroit, while the Peerless company itself, will install all the machinery.

Officials of the company are as follows: W. M. Hatch, president; Chas. S. Bush, vice-president; John Gillespie, secretary and treasurer. The plant was designed by A. F. Miller, chief engineer, who is in charge of construction. Albert Kahn, Detroit, is the architect. L. R. Vivian, engineer, assists Mr. Miller in supervising construction and John Price is general plant superintendent

Pile driving for the 800-ft. dock. The channel will be dredged to 23 ft.

Hazards That Affect Costs of Production Not Ordinarily Allowed For

But It Takes More than a $40,000 Loss to Keep This Lime Manufacturer from Smiling

DEAR Mr. R.: I have yours of the 21st, in which you ask me about our recent flood. The flood that struck us at Riverton rose 36 ft., and, of course, in its wake there was great damage done. Since the date of flood, our river has not reached anything like normal, so that it is impossible to do anything in the way of rebuilding the bridge, etc.

We opened a quarry near our plant (on the same side of the river) and have continued our business uninterruptedly. Just as soon as the river gets to a condition that suits us we will recover the girders and replace them.

As far as records go, no flood has ever occurred in this section to equal this one within 50 years, and the government having spent millions of dollars in conservation work, it was thought by conservation experts that such a flood could not occur.

Of course it is foolish to cry over spilt milk, and the damage done by the flood we are treating as all in the day's work.

An old neighbor of mine said that this flood was entirely due to the Volstead law, that we were having entirely too much water, while another said that it could be traced directly to the investigations in Washington, and a third, that all such calamities were due in the year of a general election.

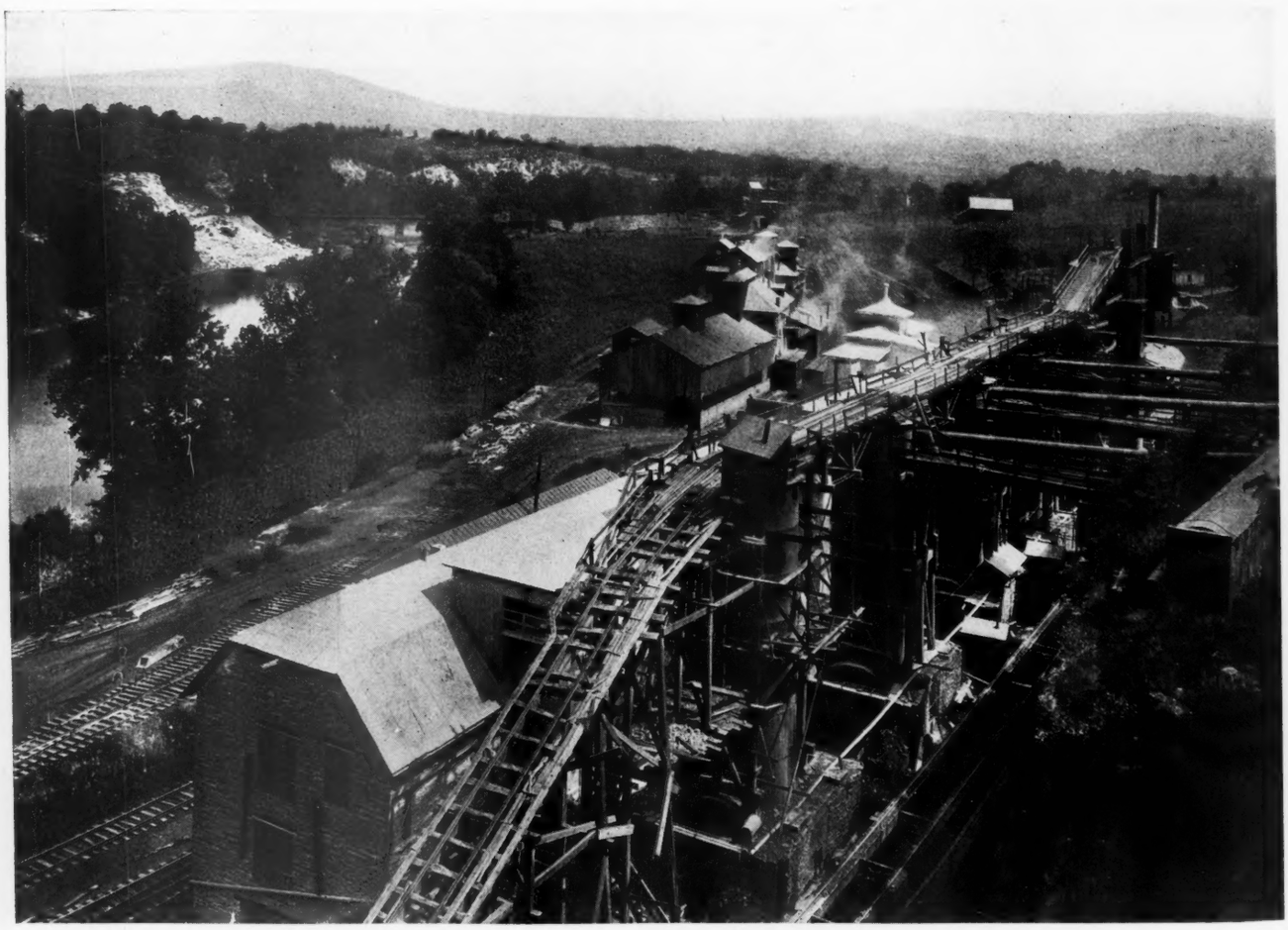
There is one thing you can make up your mind to, and that is that it doesn't worry me.

Yours sincerely,
W. E. CARSON.

Riverton, Va., July 1, 1924.

[Rock products producers who base prices on operating costs alone will do well to bear such "overhead" costs in mind.—The Editor.]

William E. Carson



Plant of the Riverton Lime Co., Riverton, Va., on the banks of the Shenandoah river which rose 36 ft. during recent floods and washed out the new $40,000 steel girder bridge shown in the view—thus cutting off the crushing and lime plants from the quarry

Editorial Comment

The "story" on the opposite page tells the thinking reader more than the destruction by flood of an essential link in a lime-plant operation. It illustrates a species of cost of production that no operator can provide for by any system of bookkeeping. A loss of $40,000 is sustained, and an even greater loss, when the inconvenience of opening another temporary quarry is considered. When the bridge is replaced the plant is the same as before. The charge of $40,000 is not new capital invested in improvements. It is, in one sense anyway, a true operating cost. If made good in one year, it would mean an impossible increase in the price of the product. Obviously it must be made good over many years' output. The obvious moral is that the operator who thinks his present margin of profit is large is fooling himself unless he includes a "factor of safety" to take care of such emergencies.

Incalculable Overhead

Nor is this an unusual case. In the June 28 issue we recorded the total loss of a New York state crushed-stone plant by fire—struck by lightning. Granted the plant was fully insured, the loss of business and inconvenience through destruction of the plant, at the very opening of its busiest season, is a loss far in excess of any insurance that may be paid.

The far-sighted operator counts his profits when he quits business, not at the end of an operating season.

In this issue and in the June 28 issue we have recorded 12 fatalities in cement plants and quarries—all within about a month's time. At the same time literature reaches our desks boasting of the splendid safety work of the portland cement industry — work that really does, without doubt, deserve the highest possible praise. Yet even as a child, back in New England, it was drilled into the mind that we should never boast of our luck, or our good fortune, for it was a sure method of bringing about the wrath of the Providence who had been kind to us. In some way it is linked up with the biblical proverb "Pride goeth before a fall."

"Eternal Vigilance"

Probably the psychology of the matter is that whenever we get "cocky" about our achievements our thoughts and energies are more or less diverted from their continuance; and we begin from that moment to slip. Consequently we have the well-known proverb: "Eternal vigilance is the price of success."

The balance to strike between keeping our noses to the grindstone and rejoicing over past achievements is a mighty hard one to hit, both as regards an industry as a whole, or any particular operation within an industry; because, unfortunately for perfection in any accomplishment, we are all human—and like diversion.

Every accident in the industry should be made a study by *every* man responsible for safety work in *every* plant, and his first thought should be: How can such an accident in my plant be avoided? Do not make it necessary for a fatal accident to occur in order to wake up both employes and management to hazards.

Teamwork is the keynote of American industrial progress. Teamwork is helping the other fellow solve his problems because some day he may be in a position to help you solve yours; and we all progress together. We have a fine example of teamwork in this issue in the discussion of a quarry problem by several of the best-known American quarry experts. We are glad the quarryman who submitted this problem happens to be on the other side of the world—in New Zealand—because it gives us an opportunity to show that the American spirit of helpfulness is not limited by national boundaries.

Helping One Another

This quarry problem and its various proposed solutions merit serious study by every man interested in quarry operation. The literature of such quarry operating practice is extremely limited. Quarrymen are seldom authors. Yet every quarryman can write eloquently when he comes to discuss some phase or problem of his own work which has cost him a lot of thinking. And every quarryman has perfectly definite ideas on how he would tackle the other fellow's quarry-operating problems.

We hope this will be the first of many such specific operating problems submitted to Rock Products by practical quarrymen—or plant superintendents in any of the rock products industries. In all such cases the editor will endeavor to handle the matter in such a way that the whole industry will derive some value from the discussion. In this way the *technique* of the whole industry will be advanced and practice improved.

Concrete buildings, it has been shown, may be so constructed as to be earthquake proof. Two recent attempts to wreck concrete structures by dynamite blasts show that if such structures are not proof against the work of vandals they certainly will withstand shocks that the dynamiter judged sufficient to injure them seriously. One of these attempts was made in an effort to wreck the Los Angeles aqueduct, which has annoyed the farmers in the Owens river district, and the other was an attempt to wreck a terminal warehouse in Cincinnati. In both cases the damage done was not serious and was quite easily repaired.

Vandal Proof Concrete

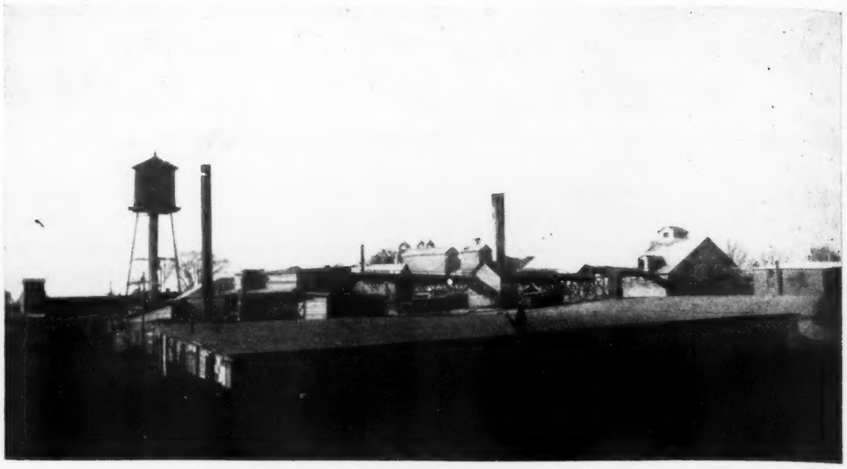
Ebsary Gypsum-Block Plant Destroyed by Fire

WHAT is believed to be an incendiary fire did damage estimated at $100,000 early this morning to the gypsum block plant owned by the Ebsary Gypsum Co., Wheatland, N. Y., at Garbutt, near Wheatland. Deputy Sheriff Edwin A. Jenkins is investigating.

Considerable difficulty was experienced in fighting the fire on account of the poor water supply and the lack of adequate fire apparatus, coupled with the big start which the fire had before firemen could reach the scene.

The Scottsville fire department aided the employes pumping water on the blaze from Oatka creek. The flames spread quickly to every part of the plant, many times endangering the lives of the firemen.

The fact that the fire had an apparent simultaneous start in various sections of the building leads the investigators to believe that it was of incendiary origin. —*Rochester Times-Union.*



Block plant of the Ebsary Gypsum Co. at Garbutt, N. Y., as it appeared before the fire

Ruins of the Ebsary gypsum block plant after fire

This plant was fully described in Rock Products, March 22, 1924. It was equipped with an especially designed block-manufacturing machine, which was a great improvement over the usual hand-casting methods previously used.

Akron Plant of the General Crushed Stone Company

AN editorial representative of Rock Products was in Akron, N. Y., immediately after the fierce electrical storm of June 21, which resulted in the destruction of the crushing plant of the General Crushed Stone Co., as noted in our issue of June 28. A view of the ruins is shown below. It is reported that the ruins had not ceased smoking before company officials and engineers were on the ground making plans for rebuilding the plant. Meanwhile the business of the company is being handled by its nearby plant at Le Roy, N. Y.

Ruins of the Akron plant of the General Crushed Stone Co.

No Damage to Nobles Gypsum Company Plant

SIR: In your issue of June 28, you published an item stating that the power plant at Akron, N. Y., was destroyed during a storm on June 21. This information is entirely wrong. The plant of the Nobles Gypsum Co. and the American Gypsum Co., at Akron, suffered no damage whatever through the electrical storm on June 21.

Our interest in the matter lies in the fact that we own the stock of this company and the writer is secretary of both companies. We would like to have you correct this report.—*The Universal Gypsum Co., C. E. Williams, Secretary.*

New California Lime Hydrate Plant

Pacific Lime and Plaster Company Just Completing Dolomite Hydrate Mill at Sonora

THE Pacific Lime and Plaster Co., San Francisco, Calif., is just completing probably the first dolomitic finishing lime hydrate mill on the West Coast. The lime plant is near Sonora and has been manufacturing lime for many years—chiefly high calcium lime. The company is affiliated with the Atlas Mortar Co., San Francisco—one of the oldest operations making mixed mortar by the Hay process. Oil is used for fuel and the capacity of the lime plant is 20,000 bbl. a month. The hydrate plant was designed and installed by H. Miscampbell, Duluth, Minn.

The company will get the dolomitic stone from a deposit three miles north of Sonora on the Columbia road recently acquired by purchase from I. S. May. A quarry has been opened on the premises and is equipped with a large air compressor and all necessary mining machinery, and rock from it is already being delivered to the plant near Sonora.

Only recently the company installed a crushing plant at its works here which has made it possible to convert all rock too small for the kilns and formerly discarded as waste into fertilizer and material of different degrees of fineness for other purposes.

At the property south of Sonora three quarries are in operation, one of which is being opened as an underground chamber.

Wasteless Quarry Operation

There is absolutely no rock handled that is not made into one product or another. The rough rock not properly sized for making lime is sold to steel companies for fluxing. The selected lumps are sent to the kilns, and the pieces too small for the kilns are sent to the crushing plant. Thus all rock broken is utilized.

The lime produced by the kilns is sold to mortar, chemical and sugar companies and to the general trade. The crushing plant grinds the rock to dust for glass making purposes, fertilizer, and other uses, and the hydrating plant, as already stated, makes both calcium and dolomite hydrate for all purposes.

With the completion of the present construction program the company will be in a position to supply practically every lime product used on the Pacific coast, and its works, consisting of mine shaft kilns, crushing plant, hydrating plant, loading and storage department, barrel making plant, shipping department and other units, and four quarries, will be the as modern and complete as any in the West. It is now giving regular employment to about 100 men and has grown to be one of the big industrial enterprises of the county.

Plant of the Pacific Lime and Plaster Co. at Sonora, Calif.

Building Material Business Holds Up Notwithstanding

Extracts of Two Eastern Building Trade Reviews Show Optimism

"LITTLE change is to be noted in the general business situation during the past month," says the June number of Tomkins Brothers *Trade Review*, New York City. "The volume of business in the building industry was surprisingly good during May, particularly so in view of an unusually rainy month. While some recession in business is reported in other industries, the demand for building materials of nearly all kinds hold up remarkably well in this section. Business is variously reported ahead of and behind last year's record, but on the average the honors seem to be about even. Every year it is usual to find June and July a moderately quiet in-between period, so that a somewhat quieter stretch of a few weeks during the early summer, as compared with the busy spring should not be cause for anxiety.

"The present seems to be a marking-time period after a mild recession which began shortly after the first of the year. We in the material industry and in the busiest section of the country find it hard to realize that a recession has been in progress. However, Government statistics and commercial reports say so, but they also indicate that the recession has already about run its course. The Federal Reserve Board expects an early revival in general business. Brookmire says that plans for 1925 expansion may well be laid now. Alexander Hamilton Institute report says that while we have been passing through a mild readjustment, 1924 consumption is not likely to decline sharply. Time is bearing out all of these predictions, and the last half of 1924 will likely be normal and healthy.

"Generally speaking, prices are still holding steady; in fact, remarkably so in view of the tendency of the industry to take things a bit easier. There have been some slight price recessions in a few materials but these reductions have not been enough to make any appreciable difference in the total cost of a building. While new projects continue to come to light in satisfactory volume, the number of jobs going ahead is somewhat smaller now than earlier in the spring. One reason for this is the high cost of all building artisans, which deters the average man from starting his building. There are thousands of these deferred projects waiting for lower building costs, no matter how long their arrival may be delayed. While wages remain high the only reduction that can be made in the cost of a building must come from lower prices of materials. This process is now being carried out. Prices of materials are receding slowly but surely. Since the peak prices of 1920, building materials have fallen 10% in some lines, 20% in others, and as much as 50% in others. The general average seems to be about 25%.

"During periods of recession in the past money has become scarce, interest rates have risen and credits have tightened as payments slowed down. The present period is not a depression but only a mild and orderly recession in the long process of returning to normal conditions. In certain lines, particularly the textiles and allied industries, business is undoubtedly slow. Folks seem to be wearing their clothes longer. But as shelter is one of the first necessities to be provided, the building material industry has always thrived and always will. That is why in our industry business is better than in some others and why credits and collections are satisfactory."

Preparing for Industrial Expansion

"Still further building material price reduction and a revival of warehouse and allied construction loom large as last-half-of-the-year prospects, says the July 5 issue of the Dow Service Building Report.

"Many of the factors operating to invigorate the latter affect the former. Housing developed the pre-eminent building investment program at the close of the Great War. From the 1919-20 construction season to 1922-23 that type of construction drew the bulk of the nation's building funds. But if the first half of 1924 showed that there was a tendency to shift the last half is calculated to accelerate the drift toward the increasing dominance of commercial building.

"For nearly five years the national construction tide has flowed unturned in the direction of domestic housing needs. Industrial construction has not participated in this boom to the same extent because America's industrial expansion has been absorbing the vast volumes of manufacturing space added to existing mills during the late national emergency.

"While industry has some of this extra factory space still to absorb before a paucity exists there is not a sufficient amount of such space now remaining unused to meet the requirements of international trade should a basis for the revival of international business relationships be reached.

"It is this increasing expectancy of the approaching resumption of world-wide commerce and the re-opening of world-wide markets for American-made products that is stimulating investment interest in warehouse and similar building projects primarily and in industrial plant expansion secondarily, for while industrial plants here and there are increasing their size, the quantity of feeler-bids being sent out to contractors and specialists in this kind of building erection by engineers and mill heads, is commanding attention.

"Commercial, mercantile and industrial investment expansions move slower than do habitation building booms. They involve accumulation of plots, often highly held on ground valuations, although the structures on them may not be worth much more than the cost of demolition. Habitation building speculation, in bulk, opens up undeveloped land on an acreage basis and the time between projection and completion is often within a single building construction season. This commercial, mercantile and industrial building movement, therefore, while at present, perhaps, nominal, when compared with the stupendous housing boom of recent experience; nevertheless is significant in that it indicates a turn in dominant type of building activity, hence it promises an improved market for materials, equipment and appliances that have lain dormant, more or less, during the last five years because housing offered them no market worthy of the name."

Road Supervisors Take Advantage of Price War

TAKING advantage of a price war waged among large sand companies of the state, members of the Platte county, Nebraska, road board of supervisors will advertise for bids for a year's supply of gravel for road surfacing in the county on the basis of 50 cents a ton, the present price. The usual price for gravel is 80 cents a ton.—*Omaha Bee.*

New Maryland Gravel Company Begins Production

NEW machinery, recently installed by the Corsica Gravel Co., is in full operation and barge loads of sand and stone are being shipped almost daily from the big "mine" on Corsica Farm, near Centreville, Md. The company has established an electric line from the gravel pit to the Centreville Electric plant and all machinery is now operated by electric power. Engineers who have made survey of the lands estimate that there are at least a million tons of desirable gravel along the Corsica shore, within easy access of the company's machinery. Steam shovels are now engaged in making excavations and thousands of tons of stone and sand are being cleaned and sorted, ready for shipment to Baltimore. The company also contemplates the manufacture of concrete blocks.—*Centreville (Md.) Observer.*

National Agstone Association Meets at Wooster, Ohio

ON JUNE 19-20, 1924, representatives of the National Agstone Association met at Wooster, O., for a conference and inspection tour of the Ohio State Experiment Station farm of 700 acres.

Station Director C. G. Williams and ex-Station Director Dr. Chas. E. Thorne, gave greetings to our crowd. These two men, together with Dr. Firman E. Bear, chief of the soils department of Ohio State University, gave our visit the prestige of having three noted soil experts of the nation with us.

Luther D. Fuller, chief agricultural agent, and H. B. Rogers, agricultural agent, of the Erie Railroad, Jamestown, N. Y., were present to discuss the running of a traveling soils laboratory and educational train over the Erie Railroad; the purpose of this project being to demonstrate and carry the Agstone message direct to the farmer in Erie Railroad territory.

The Tour of the Experiment Station Farm

Mrs. A. Acton Hall, President of the Ohio Marble Co., Piqua, Ohio, and Mrs. R. J. Fuller of Columbia Products Co., Cleveland, added grace to our visit to Wooster and the trip over the farm.

Wooster nestles in a valley. On either side rises a majestic swell and hill. The North hill is crowned with a great university. The south hill is crowned with great buildings and laboratories and plots and fields of one of the greatest agricultural experiment stations in the world. On June 20, 1924, this engine room and power house of agriculture was at its best. Seven hundred acres devoted and dedicated to scientific agriculture. For nearly two score years this farm has been a blessing to Ohio and beyond.

The experiment plots showing the results of lime and no lime on different crops teach and preach a great lesson and sermon. Seeing is believing. The crops on the plots make a more convincing speech than any bill board, book or orator can make. If every farmer in America could visit Wooster or other state experiment stations and see what limestone will do, there would be a demand for it so great that all the pulverizing mills now running could not supply the demand if they ran day and night.

The experiment plots show all the ramifications of lime and limestone. Its use, with and without barnyard manure. With and without commercial fertilizers, with and without live stock farming. With and without crop rotation, etc.

Prof. Firman E. Bear said, "Such sights as these renew even my faith in the need and use of lime and limestone."

Agstone producers should urge county agents and farm leaders to encourage every farmer to visit the state experiment station in their home state. Ohio has experiment farms in eight or ten counties, in addition to the state farm at Wooster.

The lectures and explanations given by Director Williams and Dr. Thorne were appreciated by all present.

Messrs. Poorman and Callaghan of the France Stone Co., advised that they would try to arrange a visit to the state experiment farms in Michigan and Indiana.

Stone Dust for Coal Mines

Chairman Brandon asked J. C. King to report on the progress of his investigations of the usefulness of stone dust to prevent explosions in coal mines. Mr. King stated that he was selling stone dust for this purpose and expected to establish a regular trade in this line. Mr. King stated that in his opinion both federal and state governments would give full recognition to the merits of stone dust as a preventive of explosions in mines and that within the next two years legislation would be enacted making the use of stone dust for such purposes mandatory.

Mr. King stated that coal mine owners with whom he had discussed the matter seemed friendly toward this new safety-first policy. If stone dust will reduce the number and the destructiveness of mine explosions it will also reduce the insurance risks and rates and not only save the mine owners money but will save human life. Mr. King stated that he expected to go further into this matter and give the Agstone industry the full benefit of his investigations.—*A. P. Sandles, Secretary.*

Quarry Men Attend Illinois Limestone Meeting

QUARRY operators met in Springfield, Ill., July 2 with the limestone committee of the Illinois Agricultural Association to discuss the processes of producing the limestone for the farmers.

The meeting was the first of the year. The committee is comprised of seven members who meet from time to time with the operators.

Means of handling the limestone to greater advantage to the farmer were discussed at the meeting.

Train Load of Agricultural Limestone in One Order

THE Westmoreland County Co-Operative Association, Pennsylvania, is working out plans with the Michigan Limestone and Chemical Co. and the Pennsylvania Railroad Co. for the delivery of a train load of limestone for the use of the farmers of Westmoreland county during the month of August. This train load of limestone will probably arrive in Greensburg about August 20 and be distributed to the various shipping points.—*Jeannette (Penn.) Dispatch.*

William H. Barton Leaves Lime Industry

IT is with regret the editors find the news item given below in the Springfield (Mo.) *Republican.* William H. Barton is a Cornell Uuniversity graduate in engineering, who has specialized in the manufacture of lime. Too few technical men are in the lime industry, for its own good, consequently the loss to the industry of such a man as Mr. Barton is to be regretted. The news item, referred to above, reads as follows:

"William H. Barton, for 16 years superintendent of plants of the Ash Grove Lime and Portland Cement Co. lime plants with headquarters at Springfield, Mo., has resigned, effective July 1, and will enter the oil refining business in Oklahoma. He specialized in chemistry while in college.

"Mr. Barton became superintendent when his father, James H. Barton, one of the founders of the company, died in 1908. The company in earlier days was known as the Ash Grove White Lime Co. The original plant is still at Ash Grove.

"During Mr. Barton's tenure of office he planned and executed vast improvements in the large plant of the company.

"Mr. Barton is president of the University Club and for several years was secretary. He is secretary of the city plan commission and vice-president of the Chamber of Commerce. He has been active as a civic booster ever since he came here."

Milwaukee Plans to Enlarge Municipal Quarry

PLANS of the city to increase the capacity of the municipal stone quarry from 100 to 300 yd. a day were disclosed at a meeting of the board of purchasers of Milwaukee, Wis.

Commissioner of Public Works R. E. Stoelting has asked the board to purchase for him two 5-ton trailers to be used to haul the stone from the quarry to the city.

Mr. Stoelting declared that a large crusher together with a rejection crusher have recently been added to the equipment of the quarry as the result of a $25,000 appropriation in the 1924 budget and that the quarry will soon be turning out 300 yd. a day, which will be sufficient to take care of all the city's resurfacing and repair work.

"We are able to turn out stone for the city at the rate of about $1.50 a cubic yard," said Mr. Stoelting.—*Milwaukee News.*

Four More Fatalities at Cement Plants

JUDGING from press clippings coming to the editor's desk, the splendid record of the portland cement industry in accident prevention will be spoiled by fatalities in 1924. We recorded a number of accidents in our issue of June 28. Here are four more:

H. Davis, an employe of the Monolith Cement plant near Tehachapi, Calif., died June 18 as the result of being terribly scalded Tuesday afternoon when the small engine operated on the narrow gage railroad overturned pinning him beneath. He was rushed to a local hospital but he had been so severely burned that recovery was impossible.—*Bakersfield (Calif.) Californian.*

Matthew Kvitek, age 20, was smothered to death in a hopper at the plant of the Portland Cement Co., Manitowoc, Wis., on June 19. The body was recovered within a short time after the accident occurred but the man was beyond human aid. Death was due to suffocation and a fracture of the skull.

The accident was due to a combination of circumstances in which weather conditions played a part. The limestone for the making of cement is fed into the grinding machine by large hoppers. It is first unloaded onto the dock in storage piles from the boat and then, as needed, is lifted by a clam shell into hoppers from which it is fed down a chute into a feeding device that carries the stone to the grinding machine. During dry weather the stone and dirt flows down the chute naturally, but after a long, wet spell, it sometimes clogs, and then the flow is aided by men with shovels. The chute clogged and young Kvitek got on to the slide with a shovel. There was no flow from the hopper above and whether Kvitek thought it had been shut off or not will remain a question. He started to clear the chute and was caught by a sudden flow of stone from the hopper above him which evidently had only been clogged. Kvitek was carried into the second hopper that contains the feeding machinery for the grinding machines, and w s buried under a big pile of stone.

The accident s the first serious one at the new plant and was most unfortunate. The plant complies with all the state requirements and the work in which the young man lost his life was not believed to be especially dangerous.—*Manitowoc (Wis.) Herald.*

Otto Vonesek, 23 years old, was electrocuted at the plant of the Indiana Portland Cement Co., Greencastle, Ind., June 28, when he lost his balance and, in falling, caught a live wire carrying 440 volts. Efforts were made to resuscitate him for more than four hours. A pulmotor from Indianapolis was brought here, but death was believed to have been almost instantaneous. Mr. Vonesek was assistant head electrician at the plant and came here from Chicago more than a year ago.—*Indianapolis Star.*

Jesse "Sonny" Mills, 27 years old, an employe of the Dewey Cement plant at Dewey, Okla., was killed instantly when he formed a circuit with two high voltage electric wires on a drilling machine which he was operating at the rock quarry some distance from this plant. Four hundred and forty volts shot through the man's body, killing him instantly.—*Pawhuska (Okla.) Capitol.*

Sub-Station Built to Supply Cement Plant

ANNOUNCEMENT of plans for the expending of $112,000 in the immediate construction of a power sub-station on West Point slough, near the site of the new Pacific Portland Cement Co. plant, was made last week.

Construction work on the project will be launched immediately, it was stated, the work necessitating the employment of a huge crew of workmen.

At the same time announcement was made that the Pacific Gas and Electric Co. is extending a 60,000 volt power line from Redwood City to the new cement plant by means of a series of steel towers.

Energy from the new sub-station will be supplied to the Pacific Portland Cement Co. plant. The high voltage power lines will be tapped and energy aggregating 3500 hp. will be made available for the cement works on or about July 1, the statement said.

The total expenditure entailed will exceed $112,000, it was stated.—*San Matio (Calif.) Enterprise.*

Rebuilding of Bonner Springs Portland Cement Plant Completed

JULY 1 found the old Bonner Springs cement plant completely dismantled and replaced by a more modern plant with double the capacity of the old one. The new plant cost approximately $1,500,000.

The Bonner Portland Cement Co. was sold in January, 1923, to the Kansas Portland Cement Co., a subsidiary of the International Cement Corporation, with headquarters in New York.

The new owners started the replacement of the old plant immediately after the purchase. The manufacture of cement was continued with equipment still left standing, which today is only one small unit. This unit will be dismantled soon.

With the passing of the old plant also will go the name of the cement manufactured there, "Bonner." The new product will be the "Sunflower."

The new plant uses the wet process of manufacturing. In the old plant, the stone was ground dry, and the country for a half mile around was cement colored with the dust from the plant.

The kilns are 220 ft. long and 9 ft. in diameter. A large smokestack for each kiln makes a new sky line at the plant. There also are several new buildings.

The capacity of the new plant is 3000 bbl. a day. About 225 men are employed. The old plant employed 300 men and had a capacity of 1500 bbl. a day.

The Bonner plant was built in 1908. After about a year a receiver was appointed. After another year, in which a profit of $8000 a month was shown, the plant was sold to Henry McGrew, the receiver, and business associates, for $300,000. They operated the plant until it was sold to the present owners January 3, 1923, for $600,000.—*Kansas City Star.*

New Hermitage Cement Runs at Capacity

NASHVILLE'S newest big industry, the Hermitage Portland Cement Co., is operating 24 hours a day producing cement at its capacity production of 2000 bbl. every 24 hours.

This plant was built and placed in operation largely by builders' supply men familiar with the cement business, and is operated by cement men of long experience. The officers of the Hermitage Portland Cement Co. are John C. Vance, president; T. L. Herbert, Jr., vice-president; J. N. Stone, vice-president; R. D. Herbert, secretary and treasurer, and R. T. Miller, general manager. Mr. Vance is president and principal stockholder of the Vance Iron Works, Chattanooga, Tenn. T. L. Herbert, Jr., is president of W. G. Bush and Co., president of the Herbert-Fisher Brick Co. and vice-president and general manager of T. L. Herbert and Sons. Mr. Stone is president and general manager of the Municipal Paving and Construction Co., president and general manager of the Mur-Mun Construction Co. of Bluefields, W. Va., and Durham, N. C., and vice-president of the Golden Gravel Co., Golden, Miss. R. D. Herbert is president of the Nashville Chamber of Commerce and secretary and treasurer of the W. G. Bush Brick Co. and T. L. Herbert and Sons. Mr. Miller was for 15 years with the Pittsburgh Testing Laboratories and for a number of years with the United States Testing Laboratories. Fred Stugard, general superintendent, is an experienced chemist and cement operator, having been connected with cement plants for 20 years.—*Nashville (Tenn.) Tennessean.*

New York Crushed Stone Men Meet at Utica

IN SPITE of the prevalence of most unfavorable weather conditions, the Utica meeting of the New York Crushed Stone Association on June 25, from a standpoint of attendance, turned out to be the best so far this year, twenty-two operators braving the rain to answer to roll call. It attests the increasing enthusiasm and interest in the new association, and again, all were amply repaid for their effort.

The party left the New York Central depot at 10:30 A. M. and motored to the Prospect quarry of the Lancaster and McGrew Stone Co.

Leaving Prospect, the next stop was at Trout Brook Inn, a little hostelry down in a glen where the party enjoyed a dinner which came up to all advance claims.

A business meeting was held at the Inn after the dinner at which the outstanding features were progress reports of the Tariff Committee under Mr. Hooker, and the Research Committee led by Mr. Savage. Both will report further at a subsequent meeting.

Mr. Hunter sponsored a motion expressing the thanks of the meeting to Messrs. Lancaster and Mickle for their efforts in arranging the day's successful program.

A motion was then approved to hold the July meeting at the Auburn and Oaks Corners quarries on a day to be specified later.

The meeting then adjourned and the party proceeded to Newport where the Newport Stone Co. quarry was inspected, Mr. Mickle acting as host. Favorable comment was heard in relation to this plant, the same as at Prospect.

Early in the evening the party disbanded and another meeting went into the records as favorable in every respect. —*George E. Schaefer, Secretary.*

Protest Rates on Slag and Sand

PETITION of the Birmingham Slag Co. vs. the Louisville & Nashville railroad, alleging unjust, unreasonable and discriminatory rates on slag, in carloads, from shipping points in the Birmingham district to destinations on the line of the defendant carrier, Oxmoor to Montgomery, both inclusive, was heard and taken under advisement by the Alabama Public Service Commission.

Another case representing petition by Birmingham interests heard and taken under advisement by the commission was that of the Underwood-Walker Co. and the Kirkpatrick Sand & Cement Co. vs. the Louisville & Nashville Railroad against alleged unjust and unreasonable rates on sand and gravel by carload, from Prattville Junction, Jackson's Lake and Coosada, to all stations on the L. & N., between Birmingham and Montgomery.

Missouri Town Goes into Quarry Business

WORK has begun toward the erection of the city rock crusher, just beyond the city limits, and the first lumber for use in construction of the loading chutes has been hauled. Seasoned oak lumber has been secured.

The crusher was expected to be erected and in operation by June 26, when the city council was to meet to award contracts for a large amount of street work.

All of the apparatus needed for equipping the plant is either on the ground or has been ordered. A motor to drive the crusher and a drill and air compressor have been bought.

In computing the cost of the crushed rock that will be put on the streets and charged to the property-owners, the city will not make a charge for the electric current that will be used in operating the crusher. Every other item of cost will also be kept down to the minimum, the council feeling that the city can well afford to help in this way to get the streets curbed, graded and filled in places with good rock.—*Fulton (Mo.) Gazette.*

Fight to Secure New Jersey Quarry Lands

THE hearing on the petition filed by the Pompton Sand and Gravel Co. of Passaic, N. J., against its former secretary, Charles F. McDowell, Axel V. Besker and Mrs. Charlotte A. Price, in the outcome of which there is a county-wide interest, particularly among contractors and others interested in road work in this county, has been opened before the chancery court.

Claiming that McDowell, while acting as its secretary, obtained from Mrs. Price an option on certain lands adjacent to its quarries in Pompton Plains, and that, after he resigned as its secretary and also as one of its directors, he assigned the option to Beeker, a patent lawyer, of New York City, without consideration, instead of assigning it to the corporation, as agreed, the Pompton Sand and Gravel Co. is seeking to have the option assigned to it by direction of the court.

McDowell, in his answer, denies he took the option in the name of the Pompton Sand and Gravel Co., claiming this action was taken by him in his own name.—*Patterson (N. J.) Call.*

Alabama Gravel Rate Approved

APPLICATION of the Central of Georgia Railroad Co. to put in effect from Montgomery, Ala., to Troy the same rate of 75 cents a ton on gravel as was recently ordered to be put in effect by the Atlantic Coast Line Railroad was approved recently by the Alabama Public Service Commission. —*Birmingham News.*

Lehigh Cement Company Plans Sales Drive

AN unusually elaborate dinner in connection with sales promotion plans was given Wednesday night at the Hotel Pennsylvania, New York City, by the Lehigh Portland Cement Co.

Fifty men gathered in the small ball room about 7 o'clock and were there greeted by J. C. Wahlen, special representative of the Lehigh Portland Cement Co., and by B. L. Swept, its sales manager.

During the dinner the various men present were enabled to become better acquainted with each other and with the company with which they are associated.

As a final event of the evening, an elaborate program of entertainment was given. —*New York Commercial.*

The Proposed White Cliffs Portland Cement Plant

THE new plant of the White Cliffs Products Co. at White Cliffs, Ark., will have a capacity of 2000 bbl. of cement per day (24 hours), and the entire output of the plant will find a ready market without a long freight haul. Cement manufactured from the limestone deposits at White Cliffs has been used on some of the finest structures in the South. A tentative contract has been made to secure power from the power dam, which is now being constructed by the Arkansas Light and Power Co. on the Ouachita river near Hot Springs at a very low rate, power having been the greatest problem confronting this section in the manufacture of cement heretofore.—*Little Rock (Ark.) Gazette.*

Warn Builders Imported Cement Does Not Work

SEATTLE builders were warned recently by Building Superintendent Robert L. Proctor against the use of new and untested brands of portland cement.

Proctor declared that the Seattle market has been flooded with more than a score of different brands of cement, all of which are of doubtful worth.

The cement, he said, has arrived in Seattle in vessels coming from Europe. The cement is used as ballast by the ships and can be brought here from European ports for $2 a ton.

Some of the cement, according to Proctor, has been dampened and partly solidified. It is reground here and put out to unsuspecting purchasers as being top-grade material.

Building code requirements of the city provide that all cement used in construction shall conform to certain specifications established by the American Society for Testing Materials.—*Seattle (Wash.) Star.*

Missouri Still Looking for Highway Materials Everywhere Except at Producing Plants

E. C. JOHNSON of Carrollton, a highway contractor, and B. H. Piepmeyer, state highway engineer, met in Chillicothe Wednesday and went to the Wabash gravel pit near Sampsel, where a complete inspection of the pit to ascertain its value as a road building material, and to determine, if possible, whether the gravel exists in such a quantity as to pay for the opening of the pit. The gentlemen made no formal report on their inspection before leaving town but it is the general belief here that the gravel is in sufficient quantity and of good grade to pay for the opening of the pit.

If this is true it will mean a great saving of the state in securing material for the construction of highways. It will not only save on the freight bill but will furnish material that is secured at a large cost at other places. The existence of the gravel in this county has been known for some time and for a time the pit was developed by the Wabash Railroad Co. and later abandoned.

The report of the inspection will be made to the state highway commission.

A man from the state testing laboratories spent a week at the pit some time ago and his report to the state highway commission was favorable, it is said. There is also another gravel bed near Dawn which the state highway commission is looking into with a view of ascertaining its worth as road building material.—*Chillicothe (Mo.) Constitution.*

Unexpected Honors for Sand and Gravel Man

LEWIS SMOOT, a well-known sand and gravel producer of Washington, D. C., received the "thrill that comes once in a lifetime" when he stepped off the Oriental Limited in Seattle recently and found that he had been heralded in advance as United States Senator Reed Smoot of Utah leader of the Republican party and bishop of the Mormon Church. Greeted by newspapermen, with news photographers hovering in the background, and a number of spectators who had been informed Senator Smoot would arrive in Seattle last night, Mr. Smoot got considerable enjoyment out of it.

Robert M. Jones, one of the Republican leaders in Seattle, was on hand to greet Mr. Smoot, a friend of the family, and he enjoyed the situation as much as the visitor.

"They tried to pass Senator Smoot's telegrams off on me on the train. I guess no one took the trouble to explain that Lewis Smoot was not Reed Smoot," said Mr. Smoot.—*Seattle (Wash.) Times.*

To Inspect European Sand and Gravel Operations

LOUIS McLOUTH, advertising manager, Sauerman Brothers, Chicago, sailed from New York City, July 2, as a member of the Chicago delegation to the convention of the Associated Advertising Clubs of the World at London, England, July 12-21.

After the convention he expects to visit installations of Sauerman machines in England, France, Belgium, Switzerland, Spain, Portugal and Italy; also in Sweden and Finland, if time permits. He expects to return with some interesting stories about sand and gravel plants and excavating methods in these European countries as viewed by an outsider.

New Arkansas Sand Co.

THE Little Rock Sand and Material Co., capitalized at $50,000, with several well-known local contractors as stockholders, was organized here recently, and will begin operating its plant soon.

The company has bought an eight-acre tract on the north side of the river, the western boundary of the property having a frontage on the Arkansas river of approximately 1,000 feet.

The corporation is composed of L. L. McEachin, president; C. C. Kavanaugh, vice president; Florence J. Donahue, secretary and treasurer, who, with P. F. Connelly, Henry C. McCain, J. C. Carroll and Pat F. Ring, constitute the Board of Directors, and Harry Brown and Grady Garms.—*Little Rock (Ark.) Gazette.*

Flatbush Concrete Block Plants Remain

THE attempts of the residents of Flatbush and Vanderveer Park, L. I., to drive out the concrete block factories were described in ROCK PRODUCTS of June 28. These attempts were unsuccessful, according to the *New York American,* which tells the story as follows:

"Residents of Vanderveer Park and Flatbush yesterday lost the first round of their legal battle to halt contractors from digging pits and from manufacturing cement blocks. Justice May in Supreme Court denied the application by the city for an injunction to restrain the operations.

"Justice May said that there is small probability that an injunction will be granted when the case comes to trial in the fall. He said that he believes small loss if any would fall on the residents pending trial of the action for a permanent injunction.

"Four firms were successful in warding off the injunction. They are the Hygrade Builders' Supply Co. of Avenue D and East Forty-third St.; the Egbert Concrete Products Co., Glenwood road and Utica Ave.; the Genico plant at Troy and Foster avenues and a fourth concern at Utica avenue and Avenue D.

"In his decision, Justice May said that he had visited the places named and had made a careful inspection to determine what, if any, damage had been done to the neighboring homes."

Los Angeles Moves to Eliminate Gravel Plant Near Center of the City

WHAT is regarded as an important step toward the ultimate elimination of rock crushing plants from the Arroyo Seco district was taken recently, when the Los Angeles City Council, at the suggestion of Councilman Robert M. Allan, authorized the finance committee to enter into negotiations looking toward the city's purchase of approximately 150 acres of land along the Arroyo Seco belonging to H. W. Hawley's Los Angeles Rock and Gravel Co.

The holdings, which Mr. Hawley is willing to sell to the city, are located between Avenue Thirty-five and Avenue Fifty-eight, and adjoin the 62½ acres of land which the city is now purchasing from William H. De Wolfe for $125,000. Charles M. Williams has been acting as the go-between between Mr. Hawley and the City Council in the matter.

In suggesting that the matter of purchasing the Hawley holdings be referred to the finance committee to determine price, etc., Councilman Allan in part said:

"The Council has long looked forward to the time when the bed of the Arroyo Seco and some of the adjoining property be acquired for boulevard and park purposes. Recently, the north end of the Arroyo was acquired by assessment district, thus tying in with the property owned by South Pasadena."

With reference to the recent purchase of the 62½ acres from De Wolfe, the city has paid $75,000 on account, though the whole purchase price of $125,000 will be paid for ultimately by an assessment district.

It is proposed also that an assessment district shall pay the $350,000 for the 350 acres of the Hawley holdings.

The proposed purchase of lands from Hawley, it is explained, will not take in the lands where the Hawley rock crushing plant is located, nor the lands at Avenue Twenty-one, where the city's rock crushing plant is located, the lands being leased by the city from the Hawley interests.

"The purchase of the Hawley holdings," said Mr. Williams, "will wipe out all rock crushers and stop excavations along the Arroyo between Avenue Thirty-five and Avenue Fifty-eight, all of which is in a residential district."

Welcome and Good Luck!

THE EDITOR: Please find enclosed $2 for which send us your magazine for one year.

We have a live bunch of fellows in our company and we are going to put in a modern little plant which will produce about 400 tons of crushed stone in 9 hours, and we will be equipped to run day and night. We will also be equipped to turn out as much rip-rap as we will crushed stone.

We should be able to ship rip-rap by July 15th, as we ordered our switch in and we are opening up our quarry now and have some machinery on the ground.

Any business we do is going to be pay-as-we-go and look the world squarely in the face. It seems that we have a very good prospect, for we have a wonderful deposit of extra fine stone. We will have a solid face of 25 ft. within six months' work with no overburden of any kind. Our stone is about 150 ft. deep above the surface when we get in to it.

We hope to be of mutual advantage to each other.

Yours truly,
SOUTHERN ILLINOIS LIMESTONE CO.
By W. A. Grant, President.
Harrisburg, Ill.
July 3, 1924.

Plans Progressing for Big New Gypsum Plant in Imperial Valley

CONSTRUCTION of a huge plaster mill with an ultimate capacity of 500 tons a day will be started at once at Dunaway, a station on the San Diego & Arizona Railway, 18 miles west of El Centro, by the Pacific Portland Cement Co., which has acquired the property of the Imperial Gypsum Co. (ROCK PRODUCTS, June 28.)

In addition to shipping the manufactured gypsum to markets of the coast and probably those of western states, shipments of raw gypsum also will be made, A. T. Mercier, general manager of the San Diego and Arizona Railway, was informed.

George H. Stahl, superintendent for the new owners of the gypsum deposits, was at Dunaway recently surveying the site for the units of the new mill, and probably will remain on the ground for several days. The company represented by Mr. Stahl is reported ready to distribute the product of the mill as soon as manufacture is started.

The distribution plans are to include shipments east and west and markets as far as Texas will be entered. Much of the plaster and raw material consigned to coast cities will pass through San Diego and it is expected a considerable part of the tonnage will be trans-shipped to water carriers for transportation northward.—

Missouri Cement Companies Are Fined

FINES aggregating $37,500 were assessed by the Missouri State Supreme court July 2 against the Missouri Portland Cement Co. and the Continental Portland Cement Co. of St. Louis, members of the St. Louis Material Dealers' Association, for violation of the state anti-trust laws. Cases against 11 retail companies of St. Louis, involved in the proceedings, were dismissed.

The Missouri Portland Cement Co. was fined $27,500, the Continental Portland Cement Co., $10,000.

New Financing for Hermitage Portland Cement Co.

CALDWELL & CO., Nashville, Tenn., announces the offering of a bond issue of $560,000 by the Hermitage Portland Cement Co., the bonds to sell at 92 and yield over 7.15%.

The purpose of the bond issue is to retire outstanding short-term obligations incurred in the purchase of machinery and to furnish additional working capital. The plant was built at a cost of $1,046,495.

The bond issue provides for a sinking fund which will be sufficient to retire over 70% of the bonds in a period of years. The bonds are convertable into the 8% cumulative preferred stock of the company on an attractive basis.

Woman Sues Quarry Company for Blast Injury

TRIAL was started June 26 at Paterson, N. J., before Judge Clifford L. Newman and a jury in the suit for $50,000 damages against the Consolidated Stone and Sand Co., the Franklin Contracting Corp. and the Great Notch Corp., all owning quarries in Clifton. Mrs. Anna Haeussler of 146 Atlantic street, Paterson, is the plaintiff.

Mrs. Haeussler charges that a stone hurled by the blast from one of the quarries struck her on the hand. She therefore began the suit in the alternative, naming all the quarries.

In her complaint Hrs. Haeussler alleges that while passing along Grove road in Clifton on August 30, 1923, after alighting from a bus at the Great Notch road, she sat under a tree for about five minutes with a woman companion while her son went to pick blackberries. She arose and passed the Great Notch quarry. Suddenly a blast and rumble was heard from the direction of the quarry. Within a few seconds a large stone came hurtling through the air and struck the plaintiff, she alleges, in her right hand, breaking the bones and disfiguring the ulna bone in her arm. In his opening address to the jury Isadore Rabinowitz alleged that Mrs. Haeussler has lost the use of her entire right arm.

The complaint states that the company was using highly explosive materials near a public highway in a negligent manner.

Beside the demand for $50,000, Louis Haeussler, the plaintiff's husband, asks $10,000 for loss of services and medical attention.—*Paterson (N. J.) News.*

Well-Known Cement Man Gives Life to Save Another

ARTHUR BERG NIELSEN, general superintendent of the Great Western Portland Cement Co., laid down his life June 28, 1924, at the age of 32 years, in a heroic attempt to save his assistant from drowning. Mr. Nielsen had been superintendent of the Mildred (Kan.) plant for about three years, prior to which he was with F. L. Smidth & Co., engineers, of New York, in the design and construction of the Mildred plant. The successful operation of this plant is due to Nielsen's brilliant work.

Before coming to the Great Western Portland Cement Co., Mr. Nielsen was in charge of important engineering work for F. L. Smidth & Co. on other cement plants throughout the United States.

Mr. Nielsen was born in Bergen, Norway, and received his degree in civil and mechanical engineering in technical schools of that country. He came to the United States in 1911 and since then devoted his entire time to the cement industry.

Quarry Sued Because It Did Not Warn of Blast

IN THE suit of Church Bassett against the Moberly Paving Brick Co., the jury rendered its verdict in favor of the plaintiff in the sum of $3,666.

The plaintiff had asked for a judgment of $6,000 for personal injuries alleged to have been sustained in a runaway, when his horse was frightened by an explosion resulting from a shot of dynamite at the quarry of defendant company.

The defendant was charged with negligence in not warning plaintiff of the coming explosion.—*Moberly (Mo.) Democrat.*

Batesville White Lime Plant Progress

THE work on the Batesville, Ark., White Lime Co. plant and buildings is progressing rapidly and the new railway leading from the quarry to the plant will probably be completed within the next three months. The plant proper and equipment will not be ready for operation before the latter part of the summer.—*Batesville (Ark.) Guard.*

The Rock Products Market

Wholesale Prices of Crushed Stone

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

Crushed Limestone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:						
Blakeslee, N. Y.	1.00	1.40	1.40	1.30	1.30	.....
Buffalo, N. Y.	1.30 per net ton all sizes					
Chaumont, N. Y.	1.00	.....	1.75	1.50	1.50	1.50
Cobleskill, N. Y.	1.25	1.25	1.25	1.25	1.25	.....
Coldwater, N. Y.	1.50 per net ton all sizes					
Eastern Pennsylvania	1.35	1.35	1.45	1.35	1.35	1.35
Munns, N. Y.	1.00	1.40	1.40	1.30	1.40	.....
Northern New Jersey	1.50	1.50	.....	1.50	1.50	1.40
Prospect, N. Y.	1.00	1.40	1.30	1.25	1.25	.....
Walford, Pa.	.....	.....	.....	.....	1.60b	.....
Western New York	.85	1.25	1.25	1.25	1.25	1.25
CENTRAL						
Alton, Ill.	1.50	.....	1.50	1.35	.....	.....
Buffalo, Iowa	.80	.....	1.25	1.05	1.10	1.10
Cypress, Ill.	.....	1.20	1.20	1.20	1.20	.....
Dundas, Ont.	.90	1.10	1.10	1.05	1.00	1.00
Gary, Ill.	1.10	1.40	1.10	1.10	1.10	1.10
Greencastle, Ind.	1.25	1.25	1.15	1.05	1.05	1.05
Lannon, Wis.	.80	1.00	1.00	.95	.95	.95
Northern Wisconsin	.50@1.75	.....	1.00	.90	.90	.....
River Rouge, Mich.	1.00	1.00	1.00	1.00	1.00	1.00
St. Vincent de Paul, P. Q.	.75	1.25@1.45	1.10	1.00	1.00	1.00
Sheboygan, Wis.	1.00	1.10	1.10	1.10	1.10	.....
Stone City, Iowa	.75	.....	1.40	1.30	1.25	.....
Toronto, Canada	1.90‡	2.25‡	2.25‡	2.25‡	2.00‡	2.00‡
Waukesha, Wis.	1.15	1.15	1.15	1.15	1.15	1.15
Youngstown, Ohio	.....	.....	1.30	1.55	1.55	1.55
SOUTHERN:						
Alderson, W. Va.	.75	1.75	1.75	1.60	1.50	.....
Bridgeport and Chico, Texas	1.00@1.25	1.50@1.60	1.30@1.40	1.25@1.35	1.25@1.35	1.25@1.30
Cartersville, Ga.	1.75	1.50	1.50	1.00	1.00	1.00
El Paso, Texas	1.00	1.00	1.00	1.00	.....	.....
Graystone, Ala.	Crusher run with fines out, 1.00 per net ton					
Graysville, Ga.	1.00	1.25	.....	.85@1.00	.85@1.00	.....
Russellville, Ala.	1.25	1.25§	1.50a	1.15§	1.00a	1.00
WESTERN:						
Atchison, Kans.	.50	.....	2.00	2.00	2.00	1.60‖
Blue Spr'gs & Wymore, Neb.	.20	1.45	1.45	1.35@1.40	1.25@1.30	1.20
Cape Girardeau, Mo.	1.35	.....	1.25	1.25	1.00	.....
Kansas City, Mo.	1.00	1.65	1.65	1.65	1.65	1.65

Crushed Trap Rock

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Branford, Conn.	.60	1.60	1.35	1.15	1.00	.....
Duluth, Minn.	.90@1.00	2.25	1.90@2.00	1.40@1.50	1.35@1.40	1.35@1.40
El Cerrito, Calif.	1.75	1.75	1.75	1.75	1.75	.....
Dwight, Calif.	1.75	1.75	1.75	1.75	1.75	.....
E. Summit, N. J.	1.50	2.00	1.80	1.40	1.40	.....
Eastern Maryland	1.10	1.75	1.70	1.60	1.50	1.50
Eastern Massachusetts	.85	1.75	1.75	1.25	1.25	1.25
Eastern New York	.75	1.25	1.25	1.25	1.25	1.25
Eastern Pennsylvania	1.10	1.75	1.70	1.60	1.50	1.50
Meriden, Middlefield, New Britain, Rocky Hill, Conn.	.60	1.60	1.35	1.15	1.00@1.10	1.00
Northern New Jersey	1.50@1.60	1.40@2.00	1.40@1.80	1.40	1.40	1.40
Oakland, Calif.	1.75	1.75	1.75	1.75	1.75	.....
Richmond, Calif.	.50	.....	1.50*	1.50*	1.50*	.....
San Diego, Calif.	.50@ .75	1.80@1.90	1.60@1.80	1.35@1.55	1.35@1.55	1.25@1.45
Springfield, N. J.	1.60	2.00	2.00	1.60	1.60	.....
Westfield, Mass.	.60	1.50	1.35	1.20	1.10	.....

Miscellaneous Crushed Stone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Berlin, Utley and Red Granite, Wis.	1.60	1.70	1.60	1.50	1.40	.....
Eastern Penna.—Sandstone	1.25	1.65	1.60	1.40	1.40	1.25
Eastern Penna.—Quartzite	1.20	1.35	1.20	1.20	1.20	1.20
Lithonia, Ga.—Granite	.75	2.00	1.75	1.25	1.25	1.25
Lohrville, Wis.	1.65	1.65@1.70	1.65	1.45	1.50	.....
Middlebrook, Mo.—Granite	3.00@3.50	.....	2.00@2.50	2.00@2.25	.....	1.25@2.00
Northern New Jersey (Basalt)	150	2.00	1.80	1.40	1.40	.....

*Cubic yd. †1 in. and less. ‡Prices include 90c freight. ‖Rip rap per ton. §Dust in. (a) Dust out. (b) less 10c 15 days.

Agricultural Limestone
(Pulverized)

Branchton, Penn.—100% thru 20 mesh; 60% thru 100 mesh; 45% thru 200 mesh. (Less 50 cents commission to dealers) 5.00

Osborne, Penn.—100% thru 20 mesh; 60% thru 100 mesh; 45% thru 200 mesh. (Less 50 cents commission to dealers) 5.00

Hillsville, Penn.—Analysis, 94% $CaCO_3$, 1.40% $MgCO_3$, 75% thru 100 mesh; 94% thru 50 mesh; sacks, 5.00; bulk 3.50

Chaumont, N. Y.—Pulverized limestone, bags, 4.00; bulk 2.50

Jamesville, N. Y.—Analysis, 89.25% $CaCO_3$; 5.25% $MgCO_3$; pulverized, bags, 4.00; bulk 2.50

Rockdale, Mass.—Analysis, 90% $CaCO_3$—50% thru 100 mesh; paper bags, 4.75; cloth, 5.25; bulk 3.25

North Pownal, Vt.—Analysis, 90% $CaCO_3$—50% thru 100 mesh; paper bags, 4.75; cloth, 5.25; bulk 3.25

West Stockbridge, Mass.—Analysis, 90% $CaCO_3$—50% thru 100 mesh; paper bags, 4.75; cloth, 5.25; bulk 3.25

Dundas, Ont., Can.—Analysis, 53.80% $CaCO_3$, 43.31% $MgCO_3$; 35% thru 100 mesh. 50% thru 50 mesh, 100% thru 10 mesh; bags, 4.75; bulk 3.00

Marblehead, Ohio—Analysis, 83.54% $CaCO_3$, 14.92% $MgCO_3$; 60% thru 100 mesh; 70% thru 50 mesh; 100% thru 10 mesh; 100% thru 4 mesh; 80 lb. paper sacks, 5.00; bulk 3.50

Piqua, Ohio—Total neutralizing power 95.3%; 100% thru 10, 60% thru 50; 50% thru 100 ..... 2.10@ 2.25
100% thru 10, 90% thru 50, 80% thru 100; bags, 5.00; bulk 3.50
100% thru 100, 85% thru 200; bags, 7.00; bulk 5.50

Mayville Wis.—59.8% thru 60 mesh .. 2.35

Cartersville, Ga.—Pulverized limestone 1.75

Knoxville, Tenn.—80% thru 100 mesh, bags, 3.95; bulk 2.70

Asheville, N. C.—Analysis, 57% $CaCO_3$, 39% $MgCO_3$; 50% thru 100 mesh; 200-lb. burlap bag, 4.00; bulk 2.75

Linville Falls, N. C.—Analysis, 57% $CaCO_3$, 39% $MgCO_3$; 50% thru 100 mesh; 200-lb. burlap bag, 4.00; bulk 2.75

Colton, Calif.—Analysis, 95% $CaCO_3$, 3% $MgCO_3$—all thru 20 mesh—bulk 4.00

Marion, Va.—Analysis, 90% $CaCO_3$, 2% $MgCO_3$; 42.5% thru 100 mesh, 11.3% thru 80, 20.2% thru 60, 22.8% thru 40, 3.2% thru 20 and under or 75% thru 40 mesh; pulverized, per ton 2.00

Agricultural Limestone
(Crushed)

Bedford, Ind.—Analysis, 98½% $CACO_3$, ½% $MgCO_3$; 90% thru 10 mesh ..... 1.50@ 2.00

Independence, Mo.—Analysis, 94.6% $CaCO_3$, 1.05% $MgCO_3$; 90% thru 10 mesh 1.25

Bettendorf, Iowa—97% $CaCO_3$, 2% $MgCO_3$; 50% thru 100 mesh; 50% thru 4 mesh 1.50

Blackwater, Mo.—95% $CaCO_3$; 100% thru 8 mesh 1.00

Cape Girardeau, Mo.—Analysis, 93% $CaCO_3$, 3.5% $MgCO_3$; 90% thru 50 mesh 1.50

Alton, Ill.—Analysis 99% $CACO_3$; 100% thru 4 mesh 1.75

Gary, Ill.—Analysis, 60% $CaCO_3$, 40% $MgCO_3$; 90% thru 100 mesh 1.10

Cypress, Ill.—Analysis, 96% $CaCO_3$, 2.5% $MgCO_3$; 50% thru 50 mesh 1.25

Kansas City, Mo.—50% thru 100 mesh 1.25

Moline, Ill.—97% $CaCO_3$, 2% $MgCO_3$—50% thru 100 mesh; 50% thru 4 mesh 1.50

(Continued on next page)

Agricultural Limestone

(Continued from preceding page)

Lannon, Wis.—Analysis, 54% $CaCO_3$, 44% $MgCO_3$; 99% through 10 mesh; 46% through 60 mesh	2.00
Screenings (¼ in. to dust)	1.00
Marblehead, Ohio.—Analysis, 83.54% $CaCO_3$, 14.92% $MgCO_3$; 100% thru 4 mesh; 85% thru 10 mesh; 53% thru 50 mesh; 40% thru 100 mesh (meal) bulk	1.60
32% thru 100 mesh; 51% thru 50 mesh; 83% thru 10 mesh; 100% 4 mesh (screenings) bulk	1.25
Milltown, Ind. — Analysis, 94.41% $CaCO_3$, 2.95% $MgCO_3$; 28% thru 100 mesh, 34.4% thru 50 mesh	1.35@ 1.50
River Rouge, Mich.—Analysis, 54% $CaCO_3$, 40% $MgCO_3$; bulk	.80@ 1.40
Stone City, Iowa. — Analysis, 98% $CaCO_3$; 50% thru 50 mesh	.75
Bridgeport, Texas: Screenings from ⅛ in. down to flour	1.50
Chico, Texas: Screenings from ⅛ in. down to flour	1.50
Alderson, W. Va. — Analysis, 90% $CaCO_3$; 50% thru 100 mesh	1.50
Ft. Springs, W. Va.—Analysis, 90% $CaCO_3$; 50% thru 100 mesh	1.50

Miscellaneous Sands

Silica sand is quoted washed, dried and screened unless otherwise stated.

Glass Sand:	
Berkeley Springs, W. Va.	2.25@ 2.50
Cedarville, N. J.—Damp	1.75
Dry	2.25
Cheshire, Mass: 6.00 to 7.00 per ton; bbl.	2.50
Columbus, Ohio	1.50@ 1.75
Grays Summit and Klondike, Mo.	2.00
Mapleton, Pa.	2.00@ 2.50
Mapleton Depot, Pa.	2.25@ 2.50
Massillon, Ohio	3.00
Michigan City, Ind.	.50
Mineral Ridge, Ohio	2.50
Pacific, Mo.	2.25@ 3.00
Pittsburgh, Pa.—Dry	4.00
Damp	3.00
Ridgway, Pa.	2.50
Rockwood, Mich.	2.75@ 3.25
Round Top, Md.	2.25
San Francisco, Calif.	3.00@ 3.50
St. Louis, Mo.	1.50@ 3.00
South Vineland, N. J.—Damp	1.75
Dry	2.25
Thayers, Pa.	2.25
Utica, Ill.	1.25 1.40
Zanesville, Ohio	2.50
Foundry Sand:	
Albany, N. Y.: Core	1.50
Molding fine, brass molding	2.25
Molding coarse	2.00
Sand blast	4.00
Arenzville, Ill.—Molding fine	1.50@ 1.70
Brass molding	1.75
Cheshire, Mass.—Furnace lining, molding fine and coarse	5.00
Sand blast	5.00@ 8.00
Stone sawing	6.00
Columbus, Ohio: Core	.25@ .35
Furnace lining	2.00@ 2.50
Molding fine	1.50@ 2.00
Molding coarse	1.50@ 1.75
Sand blast	3.50@ 5.00
Stone sawing	1.50
Traction	.25@ 1.00
Brass molding	2.00

(Continued on next page)

Wholesale Prices of Sand and Gravel

Prices given are per ton, f. o. b. producing plant or nearest shipping point

Washed Sand and Gravel

City or shipping point	Fine Sand, 1/10 in. down	Sand, ¼ in. and less	Gravel, ½ in. and less	Gravel, 1 in. and less	Gravel, 1½ in. and less	Gravel, 2 in. and less
EASTERN:						
Ambridge and So. Hts., Pa.	1.25	1.25	1.15	.85	.85	.85
Attica, N. Y.	.75	.75	.85	.75	.75	.75
Buffalo, N. Y.	1.10	.95			.85	
Erie, Penn.		1.00*	1.50*		2.00*	
Farmingdale, N. J.	.48	.48	.75	1.10	1.10	
Franklinville, N. Y.	.75	.75	.85	.75	.75	.75
Leeds Jct., Maine		.50	1.75		1.35	1.25
Machias, N. Y.	.75	.75	.75	.75	.75	.75
Northern New Jersey		.60	1.25	1.25	1.25	1.25
Pittsburgh, Pa., and vicinity	1.25	1.25	.85	.85	.85	.85
Washington, D. C.—Rewashed, river	.85	.85	1.70	1.50	1.30	1.30
CENTRAL:						
Attica, Ind.	.75	.75	.75	.75	.75	.75
Barton, Wis.		.70		.60	.60	
Columbus, Ohio	.85	.85@1.20	.85@1.00	.75@ .90	.75	.75
Covington, Ind.	.75	.75	.75	.75	.75	.75
Des Moines, Iowa	.50	.50	1.25	1.60	1.60	1.60
		Unwashed ballast, .50 ton				
Eau Claire, Wis.	.40	.40	.85@1.25			.85
Elkhart Lake, Wis.	.44	.40	.50	.60	.60	.60
Ft. Dodge, Iowa		1.05	2.05		2.05	
Grand Rapids, Mich.		.50		.80	.70	.70
Hamilton, Ohio		1.00			1.00	
Hersey, Mich.		.50				.70
Indianapolis, Ind.	.60	.60		.90	.75@1.00	.75@1.00
Janesville, Wis.		.65@ .75			.65@ .75	
Mason City, Iowa	.50@ .60	.50@ .60	1.35@1.55	1.35@1.55	1.35@1.55	1.35@1.55
Mankato, Minn.		.40	.40		1.25	
Milwaukee, Wis.	1.01	1.01	1.21	1.21	1.21	1.21
Minneapolis, Minn.	.35	.35	1.35	1.35	1.35	1.25
Moline, Ill.	.60	.60	1.20	1.20	1.20	1.20
Palestine, Ill.	.75	.75	.75	.75	.75	.75
St. Louis, Mo., f.o.b cars	1.20	1.45	1.65§	1.45		1.45‖
Silverwood, Ind.	.75	.75	.75	.75	.75	.75
Summit Grove, Ind.	.75	.75	.75	.75	.75	.75
Terre Haute, Ind.	.75	.60	.75	.90	.90	.85
Waukesha, Wis.	.50	.50	.80	.80	.80	.80
Yorkville, Sheridan, Oregon, Moronts, Ill.			Average .58 pit			
Zanesville, Ohio	.70		.60		.90	
SOUTHERN:						
Brookhaven, Miss., Roseland La.		.50	1.35			
Charleston, W. Va.	all sand 1.37 f.o.b cars		all gravel 1.47 f.o.b. cars			
Estill Springs, Tenn.	1.00	.90			.85	.85
Knoxville, Tenn.	1.00	1.00	1.20	1.20	1.20	1.20
Macon, Ga.	.50	.50		.75	.75	.75
New Martinsville, W. Va.	1.00	.90		1.20		.90
WESTERN:						
Baldwin Park, Calif.		.25@ .35			.50@ .75	
Crushed rock	.90@1.10	.60@ .90	.60@ .90	.60@ .90	.60@ .90	
Kansas City, Mo.		Kaw river sand .75 per ton f.o.b. plants				
Los Angeles, Calif.	.70	.70	1.10@1.15		1.10@1.15	
Pueblo, Colo.	1.10*	.90*		1.75*		1.60*
San Diego, Calif.	50@ .65	.80@ .90	1.40@1.50	1.20@1.30	1.00@1.10	1.00@1.10
Seattle, Wash. (bunkers)	1.50*	1.50*		1.50*		1.50*

Bank Run Sand and Gravel

City or shipping point	Fine Sand, 1/10 in. down	Sand, ¼ in. and less	Gravel ½ in. and less	Gravel, 1 in. and less	Gravel, 1½ in. and less	Gravel, 2 in. and less
Boonville, N. Y.	.60@ .80		.55@ .75			1.00
Brookhaven, Miss., Rosel'd, La.	.75	.50			1.25	
Dudley, Ky.‡	1.05	1.05		.95		
East Hartford, Conn.			Sand, .65 per cu. yd.			
Elkhart Lake, Wis.	.40					
Gainesville, Texas		.95				.55
Grand Rapids, Mich.				.80		
Hamilton, Ohio					.70	
Hersey, Mich.				.55		
Indianapolis, Ind.			Mixed gravel for concrete work, .65			
Lindsay, Texas		.95				.55
Mankato, Minn.			Pit run gravel, .50			
Moline, Ill.	.60	.60	Concrete gravel, 50% G., 50% S., 1.00			
Montezuma, Ind.						.60
St. Louis, Mo.						1.55
Summit Grove, Ind.	.50	.50	.50	.50	.50	.50
Waukesha, Wis.	.60	.60	.60	.60	.60	.60
Zanesville, Ohio		.60				

*Cubic yd.; †pebbles; §⅝ in. and less; ‡crushed rock; ‖2½ in. and less; (a) ¾ in. and less.

Miscellaneous Sands

(Continued from preceding page)

Delaware, N. J.:	
Molding fine	2.00
Molding coarse	1.90
Brass molding	2.15
Eau Claire, Wis.:	
Roofing sand	3.00@ 4.00
Sand blast	3.00@ 3.25
Core	1.25
Grays Summit and Klondike, Mo.:	
Molding fine	1.75@ 2.00
Joliet, Ill.:	
No. 2 molding sand and loam for luting purposes; milled	.85
Bank run	.65
Kasota, Minn.:	
Stone sawing (green)	1.50
Mapleton, Pa.:	
Molding fine, roofing sand	2.25
Mapleton Depot, Pa.:	
Molding coarse, roofing sand	2.25
Molding fine	2.50
Traction	2.00@ 2.25
Massillon, Ohio:	
Molding fine, coarse, furnace lining and core	2.50
Traction	2.50
Mineral Ridge and Ohlton, Ohio:	
Core (damp)	1.90
Furnace lining, roofing sand, stone sawing, traction (green)	1.75
Molding fine and coarse (green)	2.00
Montoursville, Pa.:	
Core	1.25@ 1.50
Traction	1.25
New Lexington, Ohio:	
Molding fine	2.00
Molding coarse	1.50
Ottawa, Ill.:	
Crude silica sand	.75@ 1.00
Core, furnace lining, steel molding	1.50
Roofing sand	1.50@ 4.50
Sand blast	4.50
Ottawa, Minn.:	
Crude silica sand	.75@ 1.00
Pacific, Mo.:	
Core, furnace lining	1.00@ 1.25
Molding fine	.90@ 1.00
Stone sawing	1.00@ 1.75
Molding coarse	.85@ 1.00
Ridgway, Pa.:	
Core	2.00
Furnace lining, molding fine, molding coarse	1.25
Traction	2.25
Rockwood, Mich.:	
Roofing sand	3.00
Sand blast	3.75
Round Top, Md.:	
Core	1.60
Traction	1.75
St. Louis, Mo.:	
Core	1.00@ 1.75
Furnace lining	1.50
Molding fine	1.50@ 2.50
Molding coarse	1.25@ 1.75
Roofing sand	1.75
Sand blast	3.50@ 4.50
Stone sawing	1.25@ 2.25
Traction	1.25
Brass molding	2.00@ 3.00
San Francisco, Calif.:	
(Washed and dried)—Core, molding fine, roofing sand and brass molding.. (Direct from pit)	3.00@ 3.50
Furnace lining, molding coarse, sand blast	3.60
Stone sawing, traction	2.30

Miscellaneous Sands

(Continued)

Tamalco, Ill.:	
Molding coarse	1.40@ 1.60
Brass molding	1.75
Tamms, Ill.:	
Ground silica per ton in carloads	20.00@31.00
Thayers, Pa.:	
Core	2.00
Molding fine and coarse	1.50
Traction	2.00
Utica, Ill.:	
Core (crude and dry)	.75@ 1.25
Furnace lining	1.25@ 2.00
Molding fine	.75
Molding coarse	.85
Roofing sand (fine and coarse)	1.25@ 2.25
Sand blast	2.25
Stone sawing	1.25@ 2.25
Traction	1.25
Brass molding	1.25
Warwick, Ohio:	
Core, furnace lining, molding fine and coarse, brass molding (all green), 1.75; all dry	2.75
Traction (dry)	2.75
Zanesville, Ohio:	
Sand blast	2.50
Core	2.00
Molding fine	1.75
Molding coarse	1.50@ 1.75
Furnace lining	2.00
Traction	2.00
Brass molding	1.75

Crushed Slag

City or shipping point EASTERN:	Roofing	¼ in. down	½ in. and less	¾ in. and less	1½ in. and less	2½ in. and less	3 in. and larger
Buffalo, N. Y.	2.35	1.25	1.25	1.25	1.25	1.25	1.25
E. Canaan, Conn.	4.00	1.00	2.25	1.25	1.25	1.15	1.15
Eastern Penn. and Northern N. J.	2.50	1.20	1.50	1.20	1.20	1.20	1.20
Reading, Pa.	2.50	1.00	.....	1.25	.....	.....	.....
Western Penn.	2.50	1.25	1.50	1.25	1.25	1.25	1.25
CENTRAL:							
Ironton, Ohio	2.05	1.45	.....	1.45	1.45	1.45	.....
Jackson, Ohio	.....	1.30	.....	1.30	1.30	1.30	.....
Toledo, O.	1.50	1.35	1.50	1.35	1.35	1.35	1.35
Youngstown, Dover, Hubbard, Leetonia, Struthers, O.	2.00	1.25	1.35	1.35	1.25	1.25	1.25
SOUTHERN:							
Ashland, Ky.	.....	1.55	.....	1.55	1.55	1.55	.....
Ensley and Alabama City, Ala.	2.05	.80	1.25	1.15	.90	.90	.80
Longdale, Goshen, Glen Wilton, Roanoke, Ruesens, Va.	2.50	1.00	1.25	1.25	1.25	1.15	1.15

Lime Products (Carload Prices Per Ton F.O.B. Shipping Point)

EASTERN:	Finishing hydrate	Masons' hydrate	Agricultural hydrate	Chemical hydrate	Ground burnt lime, Blk.	Ground burnt lime, Bags	Lump lime, Blk.	Lump lime, Bbl.
Berkeley, R. I.	.....	.....	12.00	.....	.....	.....	.....	2.30
Lime Ridge, Pa.	.....	.....	.....	.....	.....	.....	5.00a	.....
Williamsport, Pa.	.....	.....	10.00	.....	.....	.....	6.00	.....
CENTRAL:								
Cold Springs, Ohio	.....	10.50	10.00	.....	9.00	.....	10.00	.....
Gibsonburg, Ohio	12.50	.....	10.00	.....	9.00	11.00	10.00	.....
Huntington, Ind.	.....	9.50	9.50	.....	9.00	.....	8.50	1.60b
Marblehead, Ohio	.....	9.50	9.50	.....	.....	.....	8.50	1.60c
Marion, Ohio	.....	9.50	9.50	.....	.....	.....	8.50	1.60c
Mitchell, Ind.	.....	12.00	12.00	12.00	11.00	.....	10.00	1.70e
Tiffin, Ohio	.....	.....	.....	.....	9.00	.....	.....	.....
White Rock, Ohio	12.50	.....	.....	.....	9.00	11.00	.....	.....
Woodville, Ohio	12.50†	11.00†	9.00†	.....	9.00	.....	9.00	1.60
SOUTHERN:								
Erin, Tenn.	.....	.....	.....	.....	.....	.....	8.50	1.40*
El Paso, Texas	.....	.....	.....	.....	.....	.....	9.00m	1.50
Graystone and Wilmay, Ala.	12.50	11.00	.....	11.00	.....	.....	8.50	1.50
Varnons, Ala. (f)	11.00	11.00	11.00	11.00	9.50	.75d	8.50	1.50
Zuber and Ocala, Fla.	14.00	12.00	10.00	.....	.....	.....	11.00	1.60
WESTERN:								
Kirtland, N. M.	.....	.....	.....	.....	.....	.....	12.50h	.....
San Francisco, Calif.	22.00	22.00	15.00	22.00	.....	.....	.....	2.50
Tehachapi, Calif.	.....	.....	.....	.....	.....	.....	15.00	2.25

*And 1.50; †50-lb. paper bags; (a) F. O. B. Kilns; (b) wooden bbl.; (c) wooden, steel 1.70; (d) 90-lb. bag; (e) 180-lb. wooden bbl.; (f) dealers' prices; (g) to 12.00; (h) to 15.00.

Talc

Prices given are per ton f.o.b. (in carload lots only), producing plant, or nearest shipping point.

Baltimore, Md.:	
Crude talc (mine run)	3.00@ 4.00
Ground talc (20-50 mesh), bags	10.00
Cubes	55.00
Blanks (per lb.)	.08
Pencils and steel workers' crayons, per gross	1.25
Chatsworth, Ga.:	
Ground (20-50 mesh), ton	7.50
Ground (150-200 mesh), bags	8.00@12.00
Pencils and steel workers' crayons, per gross	1.50@ 2.50
Chester, Va.:	
Crude talc, per ton	4.00
Ground talc (150-200 mesh), bulk ton	7.50@ 9.00
Bags	8.50@10.00
E. Granville, Rochester, Johnson, Waterbury, Vt.:	
Ground talc (20-50 mesh) bags	7.00@10.00
Ground talc (150-200 mesh) bags	10.00@25.00
Pencils and steel workers' crayons, per gross	.75@ 2.00
Emeryville, N. Y.:	
(Air floated)—325 mesh, CL	14.75
LCL, bags included	15.25
Henry, Va.:	
Crude talc (mine run) per 2000-lb. ton	3.00@ 4.00
Ground (150-200 mesh), bags	8.75@14.00
Keeler, Calif.:	
(150-200 mesh); carloads, 60,000 lbs. (bags extra)	20.00@30.00
Marshall, N. C.:	
Ground (20-50 mesh), ton	7.50
Ground (150-200 mesh), bags	8.00@12.00
Natural Bridge, N. Y.:	
Ground talc (300-325 mesh), 200-lb. bags	13.00@15.00
Waterbury, Vt.:	
Ground talc (20-50 mesh), bulk (Bags extra)	7.50@10.00
Ground talc (150-200 mesh), bulk (Bags extra)	10.00@22.50
Pencils and steel workers' crayons, per gross	1.20@ 2.50

Rock Phosphate

(Raw Rock)

Per 2240-lb. Ton

Centerville, Tenn.—B.P.L. 65%, bags	8.50
Bulk	6.50
Gordonsburg, Tenn.—B.P.L. 68-72%..	5.00@ 5.50
Tennessee—F. O. B. mines, gross ton, unground Tenn. brown rock, 72% min. B.P.L.	5.50

(Continued on next page)

Roofing Slate

The following prices are per square (100 sq. ft.) for Pennsylvania Blue-Clay Roofing Slate, f. o. b. cars quarries:

Sizes	Genuine Bangor, Washington Big Bed, Franklin Big Bed	Genuine Albion	Slatington Small Bed	Genuine Bangor Ribbon
24x12	$10.20	$10.00	$8.10	$7.80
24x14	10.20	10.00	8.10	7.80
22x12	10.80	10.00	8.40	8.75
22x11	10.80	10.50	8.40	8.75
20x12	12.60	10.50	8.70	8.75
20x10	12.60	11.00	8.70	8.75
18x10	12.60	11.00	8.70	8.75
18x 9	12.60	11.00	8.70	8.75
16x10	12.60	11.00	8.40	8.75
16x 9	12.60	11.00	8.40	8.75
16x 8	12.60	11.00	8.40	8.75
18x12	12.60	11.00	8.70	8.75
16x12	12 60	11.00	8.40	8.75
14x10	11.10	11.00	8.10	7.80
14x 8	11.10	10.50	8.10	7.80
14x 7 to 12x6	9.30	10.50	7.50	7.80
	Mediums	Mediums	Mediums	Mediums
24x12	$ 8.10	$8.10	$7.20	$5.75
22x11	8.40	8.40	7.50	5.75
Other sizes	8.70	8.70	7.80	5.75

For less than carload lots of 20 squares or under, 10% additional charge will be made.

(Continued from preceding page)

(Ground Rock)

Mt. Pleasant, Tenn—B.P.L. 72%; per 2000 lb. ton	5.50@ 6.00
Twomey, Tenn.—B.P.L. 65%	6.50@ 7.50

Florida Soft Phosphate

(Raw Land Pebble)

Per Ton

Florida—F. O. B. mines, gross ton, 68/66% B.P.L.	2.25
70% min. B.P.L.	2.50
72% min. B.P.L.	2.75
75/74% B.P.L.	3.75

Fluorspar

Fluorspar—80% and over calcium fluoride, not over 5% silica; per ton f.o.b. Illinois and Kentucky mines	19.00@22.00
Fluorspar—85% and over calcium fluoride, not over 5% silica; per ton f.o.b. Illinois and Kentucky mines	21.00@23.50

Special Aggregates

Prices are per ton f. o. b. quarry or nearest shipping point.

City or shipping point	Terrazzo	Stucco chips
Barton, Wis., f.o.b. cars		10.50
Chicago, Ill.—Stucco chips, in sacks f.o.b. quarries		17.50
Easton, Pa.—Slate granules		6.50@ 7.00
Haddam, Conn. — Felstone buff	12.00	12.00
Harrisonburg, Va.—Blk. marble (crushed, in bags	14.50@22.50	14.50@22.50
Ingomar, Ohio (in bags)		6.00@25.00
Middlebrook, Mo.—Red		25.00@30.00
Milwaukee, Wis.		14.00@34.00
Newark, N. J.—Roofing granules		7.50
New York, N. Y.—Red and yellow Verona		32.00
Phillipsburg, N. J.—Evergreen, bulk	8.00@10.00	8.00@10.00
Creme and royal, bulk	15.00@20.00	15.00@20.00
Red Granite, Wis.		7.50
Sioux Falls, S. D.	7.50	7.50
Tuckahoe, N. Y.—2000 lb.		12.00
Whitestone, Ga.—White marble chips, net ton in bulk, f.o.b. cars, granite	4.50@ 6.00	4.50@ 6.00

Concrete Brick

Prices given per 100 brick, f.o.b. plant or nearest shipping point.

	Common	Face
Appleton, Minn.	22.00	25.00@32.00
Ensley, Ala. ("Slagtex")	12.50	33.50
Friesland, Wis.	22.00	32.00
Omaha, Neb.	18.00	30.00@40.00
Portland, Ore.	21.00	30.00@60.00
Puyallup, Wash.	20.00	30.00@90.00
Rapid City, S. D.	18.00	25.00@40.00
Salem, Ore.	23.00	50.00
Wauwatosa, Wis.	14.00@15.00	28.00@75.00
Winnipeg, Can.	15.50	

Sand-Lime Brick

Prices given per 1000 brick f. o. b. plant or nearest shipping point, unless otherwise noted.

Barton, Wis.	10.50
Boston, Mass.	15.00@16.50
Dayton, Ohio	12.50@13.50
Grand Rapids, Mich.	11.00
Jackson, Mich.	13.00
Lancaster, N. Y.	13.50
Michigan City, Ind.	11.00
Milwaukee, Wis. (delivered)	13.00
Plant City, Fla.	10.00@15.00
Portage, Wis.	15.00
Rives Junction and Saginaw, Mich.	12.00
Saginaw, Mich.	12.00
San Antonio, Tex.	12.50@13.50
Syracuse, N. Y. (delivered at job)	15.00@16.00
F.o.b. cars	17.00

Gray Klinker Brick

El Paso, Texas	13.00

Lime

Warehouse prices, carload lots at principal cities.

	Hydrated, Finishing	per ton Common
Atlanta, Ga.	22.50	14.00
Baltimore, Md.	24.25	17.85
Cincinnati, Ohio	16.80	14.30
Chicago, Ill.	20.00	20.00
Dallas, Tex.	20.00	.....
Denver, Colo.	24.00	.....
Detroit, Mich.	22.00	20.00
Minneapolis, Minn. (white)	25.50	21.00
Montreal, Que.	21.00	21.00
New York, N. Y.	18.20	13.10
St. Louis, Mo.	24.00	20.00
San Francisco, Calif.	22.60	22.60
Seattle, Wash. (paper sacks)	24.00	.....

Portland Cement

Prices per bbl. and per bag net in carload lots.

	Per Bag	Per Bbl.
Atlanta, Ga.	.....	2.35
Boston, Mass	.....	2.53@3.03†
Buffalo, N. Y.	.....	2.48@2.88†
Cedar Rapids, Iowa	.60	2.40
Cincinnati, Ohio	.61¼	2.47
Cleveland, Ohio	.59¼	2.39
Chicago, Ill.	.55	2.20
Columbus, Ohio	.....	2.44
Dallas, Texas	.53¼	2.15
Davenport, Iowa	.59¼	2.39
Dayton, Ohio	.....	2.48
Denver, Colo.	.63¼	2.55
Detroit, Mich.	.60	2.40
Duluth, Minn.	.54¼	2.19
Indianapolis, Ind.	.60¼	2.41
Kansas City, Mo.	.54¼	2.37
Los Angeles, Cal. (less 5c dis.)	.60	3.08
Memphis, Tenn.	.....	2.60
Milwaukee, Wis.	.58¾	2.35
Minneapolis, Minn.	.60½	2.42
Montreal, Canada (sks. 20c ext.)	.....	1.90b
New Orleans, La.	.....	2.40
New York, N. Y.	.....	2.25@2.65†
Philadelphia, Pa.	.....	2.41@2.81†
Phoenix, Ariz.	.82½	3.30
Pittsburgh, Pa.	.54¾	2.19
Portland, Ore.	.....	3.05
San Francisco, Cal.	.....	2.61*
St. Louis, Mo.	.57½	2.30
St. Paul, Minn.	.60½	2.42
Seattle, Wash. (10c bbl. dis.)	.....	2.90
Toledo, Ohio	.61¼	2.45

NOTE—Add 40c per bbl. for bags.
*5c cash disc. 10 days.
†Prices to contractors, including bags.
(b) Less 10c 20 days.

Mill prices f. o. b. in Carload Lots to Contractors

	Per Bag	Per Bbl.
Buffington, Ind.	.48¾	1.95
Concrete, Wash.	.....	2.60
Dallas, Texas	.....	2.10
El Paso, Tex.	.70	2.08*
Hannibal, Mo.	.....	1.95
Hudson, N. Y.	.....	2.05
Leeds, Ala.	.....	1.95
Los Angeles, Calif.	.....	2.65
Louisville, Ky.	.....	2.35
Northampton, Pa.	.....	1.95
Phoenix, Ariz.	.....	4.30†
Steelton, Minn.	.50	2.00
Universal, Pa.	.48¾	1.95

*Gross, 10c sacks and 10c per bbl. disc 10 days.
†Gross, 15c sacks and 5c per bbl. disc. 10 days.

Gypsum Products—CARLOAD PRICES PER TON AND PER M SQUARE FEET, F. O. B. MILL

	Crushed Rock	Ground Gypsum	Agricultural Gypsum	Stucco Calcined Gypsum	Cement and Gauging Plaster	Wood Fiber	White Gauging	Sanded Plaster	Keene's Cement	Trowel Finish	Plaster Board ¼x32x36" Weight 1500 lb. Per M Sq. Ft.	Plaster Board ⅜x32x36" Weight 1850 lb. Per M Sq. Ft.	Wallboard, ⅜x32 or 48" Lengths 6'-10', 1850 lb. Per M Sq. Ft.
Agatite, Texas (a)	.....	.....	6.00	10.00	10.00	10.50	10.00	.....	19.00	.....	.....	.....	.....
Akron, N. Y. (a)	3.00	4.00	6.00	10.00	10.00	10.00	20.20	7.00@9.00	27.35	21.00	19.375	20.00	30.00@32.00
Blue Rapids, Kans. (a)	2.50	4.00	6.00	10.00	10.00	10.50	10.00	.....	23.15	19.00	19.375	20.00	.....
Denver, Colo.	.....	.....	.....	11.80	.....	.....	.....	.....	.....	.....	.....	.....	.....
Douglas, Ariz.	.....	.....	6.00	.....	15.00	.....	.....	.....	.....	15.50	.....	.....	.....
Ft. Dodge, Iowa (a)	2.50	4.00	6.00	10.00	10.00	10.50	15.45	.....	22.70	20.00	19.375	20.00	30.00
Grand Rapids, Mich.	2.75	.....	6.00	10.00	10.00	10.00	.....	.....	.....	.....	.....	.....	.....
Gypsum, Ohio (a)	2.75	4.00	6.00	10.00	10.00	10.00	19.25	7.50	26.85	19.00	19.375	20.00	30.00
Port Clinton, Ohio	3.00	4.00	6.00	8.00	10.00	10.00	.....	7.50	30.15	.....	.....	20.00	30.00
Portland, Colo.	.....	.....	.....	10.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Francisco, Calif.	.....	12.00	12.00	15.40†	.....	.....	16.40‡	.....	.....	.....	.....	.....	.....
Winnipeg, Man.	5.50	5.50	7.00	13.50	15.00	15.00	.....	.....	.....	.....	28.50	.....	35.00

NOTE—Returnable Bags, 10c each; Paper Bags $1.50 per ton extra (not returnable).
†CL.; LCL., $16.50; ‡finishing, CL.; LCL., $17.50; (a) prices are net of bags.

Traffic and Transportation

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Proposed Changes in Rates

THE following are the latest proposed changes in freight rates up to the week beginning June 30:

New England Freight Association

6534. Molding sand. Elnora, Reynolds, Schagticoke, Schuylerville, Scotia, Saratoga Springs, Stillwater, Wayville, Ushers, N. Y., to Trenton, N. J., 16 cents. Reason: To permit movement of traffic.

6548. Lime. From N. Y. N. H. & H R. R. and B. & A. R. R. lime shipping stations to stations on Erie R. R., C. R. R. of N. J., N. J. & N. Y. R. R. and N. Y. S. & W. R. R. 17-19½ cents. Reason: Equalization of competitive conditions.

6566. Cement. Hudson Upper, N. Y., to Hudson, N. Y., $1.25 net ton. Reason: To make rate same as applied in opposite direction.

Southern Freight Association

14351. Slag. Carloads, minimum weight 30 net tons, from Birmingham, Ala., to Boaz, Ala. Present rate, 42½ cents per 100 lb. (Class A); proposed, $1.47 per net ton, same as present rate to Albertville, the next more distant point beyond.

14376. Sand (except molding sand). Carloads, minimum weight 10% less than marked capacity of car, from Dixiana, S. C., to Kingsport, Tenn. Lowest combination now applies. Proposed, $1.85 per ton, based on the Georgia proposed scale, reduced 10% for the joint distance of 304 miles.

14390. Gravel. Carloads, from Nashville, Tenn., to Louisville, Ky. Present rate, 23½ cents per 100 lb. (Class A); proposed, 8 cents per 100 lb., same rate applicable on sand, carloads, from Nashville to Louisville, also same as rates on sand and gravel from stations on either side of Nashville.

14411. Cement. Carloads, from Kingsport, Tenn., to Greasy Creek, Ky. Present rate, 18.3 cents; proposed, 14½ cents per 100 lb., same as in effect to other stations on the Big Sandy Line of the C. & O. Ry.

14415. Slag. Carloads, minimum weight 90% marked capacity of car; except when cars are loaded to their visible capacity actual weight will govern from Birmingham, Ala., group to Sylvania, Ga. Present rate, $2.82 per net ton (Atlanta, Ga., combination); proposed, $2.30 per net ton, based on the proposed Georgia scale for joint haul between trunk lines and relief lines, less 10%.

14423. Slag. Carloads, minimum weight marked capacity of car, from Birmingham, Ala., and points taking same rates, to stations on the I. C. R. R. Jackson, Tenn., to Rives, Tenn., inclusive. Class rates now apply. Proposed, $1.35 per net ton, same as rate to opposite stations on the M. & O. R. R.

14436. Stone, crushed. Carloads, minimum weight, 60,000 lb., from Whitestone, Ga., to Downers Grove, Ill. Present rate, $5.73 per net ton. (Chicago, Ill., combination); proposed rate, $4.48 per net ton, which reflects a differential of 25 cents per ton over rate to Chicago, Ill.

14465. Lime (other than agricultural). Carloads, minimum weight, 24,000 lb., from York, Penn., to South Clarksville, Va. Present rate, 42 cents per 100 lb. (Class A); proposed, $5.29 per net ton, same as rate in effect to LaCrosse, Va.

14481. It is proposed to revise the rates on cement, carloads, from Richard City, Tenn., to L. & N. R. R. Kentucky Division Cumberland Valley Division and Eastern Kentucky Division stations to be the same as checked in by the Fourth Section Committee. Generally speaking, the proposed revision represents reductions.

14520. Sand and gravel. Carloads, from Montgomery, Ala., to Coreen, Ga. Present rate, $2 per net ton (Cordele, Ga., combination); proposed, $1.67 per net ton, made on basis of the joint lines scale proposed by carriers for application in Georgia and Alabama for the continuous distance via S. A. L. Ry. Cordele and G. S. & F. Ry., reduced 10%.

14521. It is proposed to correct the present rate on limestone, ground or crushed, in sacks, barrels or in bulk, carloads, minimum weight 30,000 lb. per car of 30,000 lb., excess in proportion, between stations on the S. A. L. Ry and its subsidiary lines in Florida for distances 340 and over 330 miles and 350 and 340 miles to read $28.50 per car, instead of $28 per car. The proposed revision is for the purpose of correcting a clerical error.

14544. Cement. Carloads, from Birmingham, Ala., and group to Meridian, Miss. Present rate, via A. G. S. R. R. 15 cents; via other lines, 11½ cents per 100 lb. Proposed rate, via all lines, 15 cents per 100 lb., or the same as in effect via the A. G. S. R. R.

14552. Sand, straight carloads, or sand and gravel, mixed, in bulk. Carloads, from Macon, Ga., to Coreen, Ga. Present rates: Intrastate 80 cents per net ton, interstate, 72 cents per net ton; proposed, both interstate and intrastate, 72 cents per net ton.

14602. Stone, crushed and screenings. Carloads, minimum weight marked capacity of car, but not less than 60,000 lb., from Tucker, Ky., to Dumesnil and Prestonia, Ky. Present rates to Dumesnil, 63 cents; proposed, 50 cents per net ton; to Prestonia, present rate, 45 cents; proposed 54 cents per 100 lb. Proposed rates are based on the mileage scale published by Southern Ry. in its I. C. C. A9490, for application between points on its system lines.

Central Freight Association

8670. Crushed stone. New Paris, Ohio, to Cincinnati, Ohio. Present, 80 cents per net ton; proposed, 70 cents per net ton.

8671. Sand and gravel. Zanesville, Dresden, Ellis and Gilbert, Ohio, to Steubenville, Mingo Jct. and Jewett, Ohio. Present, $1.40 per net ton; proposed, $1.10 per net ton.

8674. Crushed stone. Middlepoint, Ohio, to Larwill and Hoagland, Ind. Present, to Larwill, 92 cents per net ton; to Hoagland, 76 cents per net ton. Proposed, to Larwill, 80 cents per net ton; to Hoagland, 70 cents per net ton.

8702. Gravel and sand (other than blast, engine, foundry, molding or silica). Milford Junction and Leeland, Ind., to Indiana and Ohio (in cents per net ton):

	Present cents	Proposed cents
Nappanee, Ind.	69	63
Albion, Ind.	81	70
Avilla, Ind.	88	75
Garrett, Ind.	88	75
Auburn Jct., Ind.	88	85
Concord, Ind.	97	85
St. Joe, Ind.	97	85
Hicksville, Ohio	97	85
Rosedale, Ohio	270	85
Mark Centre, Ohio	270	85
Sherwood, Ohio	270	90
The Bend, Ohio	280	90
Defiance, Ohio	280	90
Standley, Ohio	300	90
Holgate, Ohio	300	90
Hamler, Ohio	300	90
Deshler, Ohio	320	90
Michigan City, Ind.	.....	100

8711. Sand and gravel. Kern, Ind., to Dewey, Fisher, Dickerson and Lotus, Ill. Present, 6th class; proposed, $1.14 per net ton to all points except Lotus, Ill., $1.21 per net ton.

8712. Cement, common, hydraulic, natural or portland. Fultonham, Ohio, to Cincinnati, Ohio. Present, 12 cents; proposed, 10 cents; to apply only on shipments destined to points south of the south bank of the Ohio river.

8713. Crushed stone. White Sulphur, Ohio, to Ohio. Present, 6th class; proposed, to Bucyrus, Robinson, Leesville, Toledo, Jct., and Mansfield, Ohio, 90 cents per net ton. To Lima, LaFayette, Ada, Dola, Dunkirk, Forest, Kirby, Upper Sandusky, Douglas, Nevada, Glenville, Lucas, Perrysville, Loudonville, Lakeville, Big Prairie, Custaloga, Shreve, Wooster and Smithville, Ohio, $1 per net ton. To Orrville, Burton City, Lawrence, Massillon and Canton, Ohio, $1.10 per net ton.

8714. Sand and gravel. Hugo, Ohio, to Ohio and Pennsylvania points. Present, 6th class; proposed (Rates in cents per ton of 2000 lb.):

To	Note A	Note B
Alliance, Ohio	60	.....
Andover, Ohio	100	.....
Bergholz, Ohio	90	.....
Braceville, Ohio	80	.....
Bradley, Ohio	110	.....
Elyria, Ohio	90	.....
Farrell, Penn.	.....	105
Fowler, Ohio	90	.....
Girard, Ohio	80	.....
Hopedale, Ohio	100	.....
Hubbard, Ohio	90	.....
Madison, Ohio	100	.....
Mentor, Ohio	90	.....
Minerva, Ohio	80	.....
New Castle, Penn.	.....	115
Niles, Ohio	80	.....
Norwalk, Ohio	110	.....
Painesville, Ohio	100	.....
Phalanx, Ohio	80	.....
Palmyra, Ohio	80	.....
Sharon, Penn.	.....	105
Sharpsville, Penn.	.....	105
Wakeman, Ohio	100	.....
Warren, Ohio	80	.....
West Middlesex, Penn.	.....	115
Williamsfield, Ohio	100	.....
Youngstown, Ohio	80	.....

Note A applies on shipments when loaded in open top cars. When loaded in box cars rates will be 115% thereof.

Note B applies on sand (other than blast, engine, foundry, glass, molding or silica) and gravel.

8732. Stone, broken, crushed, and screenings in bulk. Rock Point and Ellwood City, Penn, to Tidioute, Jamison, Tionesta and Titusville, Penn. Present, 18½ cents to Tidioute and Jamison, Penn., and 17½ cents to Tionesta, Penn; to Titusville, Penn., and commodity rate of $1.40 per net ton. Proposed, $1.50 to Tidioute; $1.40 to Jamison and Tionesta, Penn., and $1.20 per net ton to Titusville, Penn.

8734. Sand and gravel. Urbana, Ohio, to Grove City, Ohio. Present, 13½ cents; proposed, 80 cents per net ton.

8777. Sand (all kinds) and gravel. Cleveland and Akron, Ohio, to Alexanders, Brecksville and Peninsula, Ohio. Present, 70 cents per net ton; proposed, 60 cents per net ton.

Southwestern Freight Association

1160. Cement. To establish rate of 23½ cents per 100 lb. on cement, carloads as described in S. W. L. Trf. 90E, from Harrys and Eagle Ford, Tex., to stations on the Christie & Eastern Ry. It is claimed the proposed change is desired in order to place Harrys and Eagle Ford, Tex., on a proper relation with other cement producing points.

1161. Cement. To establish rates of 23½ cents per 100 lb., carloads, as described in S. W. L. Trf. 90E, from Harrys and Eagle Ford, Tex., to stations on the Red River & Gulf Ry. It is claimed the proposed change is desired in order to place Harrys and Eagle Ford, Tex., on a proper relation with other cement producing points.

1167. Cement. To establish rate of 23½ cents per 100 lb. on cement, carloads, as described in S. W. L. Trf. 90E, minmum weight as per tariff, from Harrys and Eagle Ford, Tex., to G. C. & S. F. Ry. Louisiana stations. The proposed change is desired in order to place Harrys and Eagle Ford, Tex., on a proper relation to other cement producing points.

1168. Cement. To establish rate of 23½ cents per 100 lb. on cement, carloads, as described in S. W. L. Trf. 90E, minimum weight as per tariff, from Harrys and Eagle Ford, Tex., to Louisiana and North West R. R. stations Petty to Chestnut, La. The proposed change is desired in order to place Harrys and Eagle Ford, Tex., on a proper relation to other cement producing points.

1170. Cement. To establish rates of 23½ cents per 100 lb. on cement, carloads, as described in S. W. L. Trf. 90E, minimum weight as per tariff, from Harrys to Eagle Ford, Tex., to Oakdale and Gulf Ry. stations. The proposed change is desired in order to place Harrys and Eagle Ford, Tex., on a proper relation to other cement producing points.

1171. Cement. To establish rate of 23½ cents per 100 lb. on cement, carloads, as described in S. W. L. Trf. 90E, minimum weight as per tariff, from Harrys to Eagle Ford, Tex., to Leesville, Slagle & Eastern Ry. stations. The proposed change is desired in order to place Harrys and Eagle Ford, Tex., on a proper relation to other cement producing points.

1172. Cement. To establish rate of 23½ cents per 100 lb. on cement, carloads, as described in S. W. L. Trf. 90E, minimum weight as per tariff, from Harrys and Eagle Ford, Tex., to Neame, Carson and Southern R. R. Co. stations. The proposed change is desired in order to place Harrys and Eagle Ford, Tex., on a proper relation to other cement producing points.

1173. Cement. To establish rate of 25½ cents per 100 lb. on cement, carloads, as described in S. W. L. Trf. 90E, minimum weight as per tariff, from Harrys and Eagle Ford, Tex., to Louisiana & Pacific Ry. Stations. The proposed change is desired in order to place Harrys and Eagle Ford, Tex., on a proper relation to other cement producing points.

1194. Cement. To establish rate of 23½ cents per 100 lb. on cement, carloads, as described in S. W. L. Trf. 90E, minimum weight as per tariff, from Harrys and Eagle Ford, Tex., to Kinder & North Western Ry. Stations. The proposed change is desired in order to place Harrys and Eagle Ford, Tex., on a proper relation with other cement producing points.

1212. Asbestos cement. To establish on asbestos cement, carloads, minimum weight 50,000 lb., rate of 53½ cents per 100 lb. from St. Louis and Kansas City, Territories to West Monroe, La., Class C differentials to be applied from other defined territories. Rate of 53½ cents at present applies from St. Louis and Kansas City territories to Monroe, La., and it is claimed same rate should also apply to West Monroe.

1220. Cement. To establish rates on cement, carloads, as described in S. W. L. Trf. 90E, from Harrys and Eagle Ford, Tex., to stations on the C. R. I. & P. Ry., viz: 20½ cents per 100 lb. to Berger to Cooks' Spur, Ark., inclusive, Fordyce, Ark., Lindale to Tinsman, Ark., inclusive; 23 cents to Banks to Crossett, Ark., inclusive; 20½ cents per 100 lb. to Eldorado, Ark., inclusive; Cargile to Junction City, Ark., inclusive and Junction City, Ark., to Winnfield, La., inclusive; 24 cents per 100 lb. to Sartori to Pine Prairie, La., inclusive; 28½ cents per 100 lb. to Easton to Nubern, La., inclusive; 20½ per 100 lb. to Opitz to Kent, Ark., inclusive, Camden, Ark., Cove Creek, Ark., and Price to Hot Springs, Ark. The proposed change is desired in order to place Harrys and Eagle Ford, Tex., on a parity with other cement producing points.

1243. Cement. To establish same rates as are now in effect to Gardner, La., on the A. & W. Ry. on cement, carloads, as described in S. W. L. Trf. No. 90E from interstate points of origin to stations on A. & W. Ry., Camp Four to McFarland, La., inclusive. It is contended that these additional points on the A. & W. Ry. should be accorded same rates as Gardner on account of the distance being approximately the same.

1255. Cement. To establish rate of 20 cents per 100 lb. on cement, carloads, as described in S. W. L. Trf. 90E from Harrys and Eagle Ford, Tex., to V. S. & P. Ry., points in Louisiana as shown in Trf. 90 series. Proposed adjustment is claimed necessary to place rate from these Texas points to the Louisiana points referred to on a proper relation to rates from other points and to rates in effect from Shreveport and Bossier City, La.

1274. Cement plaster and articles taking same rates. To establish same rates on cement plaster and articles taking same rates, as described in Item 1. S. W. L. Trf. 3E, from Plasterco Junction, Jamlin and Rotan, Tex., to interstate points as are now carried from other Texas producing points in S. W. L. Trf. 3E. These mills come in direct competition with mills located at Acme, Agatite, Sweetwater and Pyramid, are located in the same general vicinity, serve the same points of consumption, are as a general rule on the same basis, and the producers at Plasterco Junction, Hamlin and Rotan desire to be placed on a parity.

1285. Stone or rock. To establish rate of 29½ cents per 100 lb. on stone or rock crushed or ground, carloads, stone exclusive of marble, rough quarried, carloads, minimum weight 50,000 lb. from Ponder, Tex., to New Orleans, La. According to the shipper it is necessary that a rate considerably lower than the present basis be established in order to permit movement.

1324. Cement. To establish the following rates in cents per 100 lb. on cement. carloads, as described in S. W. L. Trf. 90E from Harrys and Eagle Ford, Tex., to Arkansas points on De Queen & Eastern Ry. shown below:

West Line	20½
Rolling Fork	20½
DeQueen	20½
Geneva	23
Locksburg	23
Provo	23
Shrum Springs	23
Dierks	23

Shippers contend that on account of distance rates from Harrys and Eagle Ford, Tex., rate be made the same as in effect from Ada, Okla.

1329. Cement. To establish rate of 20½ cents per 100 lb. to Ruston, La., on cement, carloads, as described in S. W. L. Trf. 90E from Harrys and Eagle Ford, Tex., to V. S. & P. Ry. stations in Louisiana, Ruston, La., and west. Proposed change is desired to meeting change proposed under Subject No. 1220.

1341. Gravel, crushed stone and sand. To establish same rates and application on gravel, crushed stone and sand, carloads, minimum weight marked capacity of car, from points in Kansas located on A. T. & S. F. Ry., K. C. M. & O. Ry., K. O. & G. Ry., M. K. T. Ry., St. L.-S. F. Ry, C. R. I. & P. Ry., K. C. S. Ry., Midland Valley R. R. and Mo. Pac. R. R., to points in Oklahoma, as provided in Item 6675B Sup. 52 to S. W. L. Trf. 44M. Item 6675B S. W. L. Trf. 44M names the proposed scale of rates from Oklahoma points to points in Kansas, and it is shippers' desire to have the same scale established in the reverse direction.

1418. Cement, portland, hydraulic and paving. To establish rate of 23½ cents per 100 lb. on cement, portland, hydraulic and paving, minimum weight 50,000 lb. from Ada, Okla., to Cobb Spur, La., Index 9660, to Rochelle, La., Index 9770, to Granger Spur, La., Index 9855, inclusive; Archibald, La., Index 10395, to Clayton, La., Index 10470, inclusive; Clayton Jct., La., Index 10210, to Panola, La., Index 10220, inclusive, and rate of 20½ cents per 100 lb., to Sweet Home, Index 8420, to Brewster Spur, Ark., Index 8490, inclusive. The proposed change is desired in order to remove fourth section violations and apply the rates at Mississippi river points as maxima at directly intermediate points.

Illinois Freight Association

377K. Lime. Carloads. To establish one minimum weight and one rate on, from Mosher and Ste. Genevieve, Mo., to Decatur, Ill. Present, 13 cents per 100 lb., minimum weight 30,000 lb.; 10½ cents per 100 lb., minimum weight 60,000 lb.

2540. Gravel, torpedo sand and sand. Carloads, from Spaulding, Ill., to destinations in I. R. C. territory. Present, classification basis; proposed, Bloomington, $1.36; Danville, $1.11; Kankakee, 98 cents; Peoria, $1.61; Rockford, $1.26; Milwaukee, $1.26; Waukesha, $1.51, etc.

2547. Sand. Carloads, minimum weight capacity of car, Lincoln, Ill., to Tolono, Ill. Present, 88 cents per net ton; proposed, 80 cents per net ton.

2553. Sand and gravel. Carloads, minimum weight capacity of car from Grayville, Ill., to Brown's, Ill. Present, 76 cents per net ton published in I. C. R. R. Tariff 13321-E; proposed, 70 cents per net ton.

2555. Stone, crushed. Carloads, minimum weight capacity of car from Thornton, Ill., to various points, viz; present, class rates; proposed, $1.26 per net ton to Harrisburg, New Burnside, Tunnel Hill, Belknap, Karnak, America, Ill., etc.

2558. Sand, gravel and crushed stone, Carloads. minimum weight capacity of car, sand and gravel from Forreston to Galena, Ill., present, $1.01; proposed, 90 cents; E. Dubuque, Ill., present, $1.01; proposed, 90 cents; sand and gravel and crushed stone from Rockford to Galena, Ill., present, $1.01; proposed, 90 cents; E. Dubuque, Ill., present, $1.13; proposed. 90 cents; sand and gravel, from Coleman to Galena, Ill., present, $1.13; proposed, $1.03; E. Dubuque, Ill., present, $1.26; proposed, $1.03; crushed stone, from Hillside to Galena, Ill., present, $1.26; proposed. $1.12; E. Dubuque, Ill., present, $1.39; proposed, $1.13. Present rate in I. C. R. R. Trf. 13321E.

2555A. Stone, crushed. Carloads, minimum weight, capacity of car from Thornton, Ill., to various points, viz.; present, class rates; proposed, $1.26 per net ton, to Harrisburg, New Burnside, Tunnel Hill, Belknap, Karnack, America, Ill., etc., $1.13 per net ton from Lehigh, Ill., to destinations as above.

Texas-Louisiana Tariff Bureau

5998-TX. Cement (natural or portland). Carloads, rates on from Houston and Manchester to Shreveport, La. Proposition from carriers to establish rates of 18½ cents per 100 lb. on cement (natural or portland), carloads, minimum weight 50,000 lb., from Houston and Manchester to Shreveport, La. Proposed rate to meet competition from other producing points.

6000-TX. Crushed stone, also rough dressed or sawed, rates on from Coreth, Tex., to Houston and Galveston, Tex. Proposition from shippers to establish on crushed stone as described in item 1750 of Texas Lines Trf. 2H from Coreth, Tex., to Houston 8 cents, to Galveston 8½ cents; on rough dressed or sawed stone as described in item 8375 of Trf. 2H to Houston 8 cents, to Galveston 9 cents; on crushed stone for municipal purposes, to Houston 7½ cents, to Galveston 8 cents per 100 lb. Proposed rates to take care of a rock crushing plant now under construction at Coreth, Tex.

6014-TX. Cement. Carloads, rates on from Harrys and Eagle Ford to points on K. C. S. Ry., North Shreveport, La., to Ravanna, Ark., inclusive. Proposition from shippers to establish rate of 19½ cents per 100 lb., on cement, carloads, as described in S. W. L. Trf. 90E minimum weight as per same tariff from Harrys and Eagle Ford, Tex., to stations on K. C. S. Ry., North Shreveport, La., to Ravanna, Ark., inclusive. Shippers state that they should be placed on a parity and more proper relationship with the rates from Ada, Okla., the Kansas Gas Belt, and Kansas City rate point origins.

Trunk Line Association

12077. To establish rates on cement-compound or waterproof cement, carloads, minimum weight 50,000 lb., from Hagerstown, Md., to Trunk Line territory on basis of ½ cent per 100 lb. higher than rate now applying on cement.

12086. To revise rates on crushed stone or broken stone, coated with asphalt, cement, oil, tar or asphaltum, from Glen Mills, Penn., to various, Penn. R. R. points, to basis of 10 cents per net ton higher than rates in force on crushed stone from Glen Mills.

12106. To revise class rates between Wheeling District on one hand and Huntington-Kenova district on the other, eliminating existing violations caused by lower rates now carried from and to stations located between Huntington and Kenova by advancing such rates to those now applicable from and to Huntington and Kenova as follows:

	1	2	3	4	5	6
Per cwt.	80½	68½	54	40½	28	22½

Western Trunk Line Association

3929. Sand and gravel. Carloads, from Dubuque, Iowa, to destinations in C. F. A. territory as shown on pages 11, 12, 13, and 14 of W. T. L. Trf. 41N (Ind., Mich., Ohio, Penn., Ky., N. Y., W. Va.). Present, full combination of locals; proposed, the same as applies under the above mentioned tariff from Muscatine, Iowa.

3931. Lime, plaster. Carloads, from Duluth, Minn., and Superior, Wis. Present and proposed (in cents), to a few points representative of the situation.

	Lime		Plaster	
To C. & N.W.	Pres.	Pro.	Pres.	Pro.
Frost, Minn.	29½	17½	29½	18½
Lake Mills, Iowa	29½	17½	29½	18½
Mason City, Iowa	29½	17½	29½	18½
Hanford, Iowa	29½	17½	29½	18½
Dumont, Iowa	29½	17½	29½	18½
Kesley, Iowa	29½	19½	29½	20
Parkersburg, Iowa	29½	19½	29½	20
Buckingham, Iowa	29½	21	29½	21½
Irving, Iowa	29½	23	29½	23½
Welcome, Minn.	30½	19½	30½	20½
Lone Rock, Iowa	30½	19½	30½	20½
Ledyard, Iowa	32½	19½	19	19
Algona, Iowa	32½	21	19	19
Eagle Grove, Iowa	32½	21	32½	22
Webster City, Iowa	32½	21	32½	22
Des Moines, Iowa	32½	23	32½	24

Minimum weight lime 30,000 lb.; plaster, 40,000 lb.

3952. Stone, crushed and stone paving blocks. Carloads, from Jasper, Pipestone and Quartzite, Minn., and Sioux Falls, S. D., to St. Louis, Mo. Present, 26 cents per 100 lb. (Class D); proposed, 14 cents per 100 lb., on crushed stone 15 cents per 100 lb. on paving blocks. Minimum weight 90% of marked capacity of car; except when car is loaded to full visible capacity, actual weight will apply but not less than 50,000 lb.

Railroads Ordered to Pay Reparation

ORDER of the Alabama Public Service Commission based on rehearing as to reparation of the complaint of Hodgson and Jones, of Montgomery, vs. the Southern, Mobile & Ohio and Western Railway of Alabama for just and reasonable rates on sand from Jones, Ala., to Montgomery awarded reparation to the complainant totalling $420.30.

The Southern and the Western Railroads are required under the order to pay the complainant $409.08 as reparation, payment to be made within 30 days. The Southern and the Mobile & Ohio Railroads are required to pay to the complainant within the same period $11.22 as reparation.

The commission's finding of reparation includes all shipments of sand in carloads received by the complainant at Montgomery when originating at Jones, Ala., within three months from Oct. 25, 1923.—*Birmingham News.*

New Machinery and Equipment

Dragline Model at British Empire Exhibition

RUSTON & HORNSBY, LTD., Engineers, Lincoln, England, leading British manufacturers of power shovels, draglines, cranes, etc., have an interesting exhibit at the great British Empire Exposition now being held in London. The exhibit consists of oil engines, pumps, gas producers and a working model dragline, shown in the accompanying view.

Ruston and Hornsby dragline made in sizes to handle buckets from ¾ to 10 yd.

The "Ruston" standard draglines vary in weight from 17 to 300 tons, with buckets from ¾ to 10 cu. yd. capacity. The jibs are from 30 to 160 ft. long, depending upon the size of the machine and capacity of the bucket. Various jib lengths with buckets to suit can be used on each of the seven standard sizes—for instance, on a machine weighing 300 tons, 6 lengths of jibs from 100 to 160 ft. can be used with buckets from 5 to 10 cu. yd. capacity.

The boilers can be fired with coal, wood or oil fuel as required, or electric motors can be used in place of the steam engines when it is desired to operate the machine electrically.

The model does not pretend to show any particular size or design. It is simply a working model to illustrate the digging, dumping, slewing and traveling motions of a typical dragline excavator mounted on caterpillar tracks. Rail wheels can be used as an alternative to the caterpillar gear if desired.

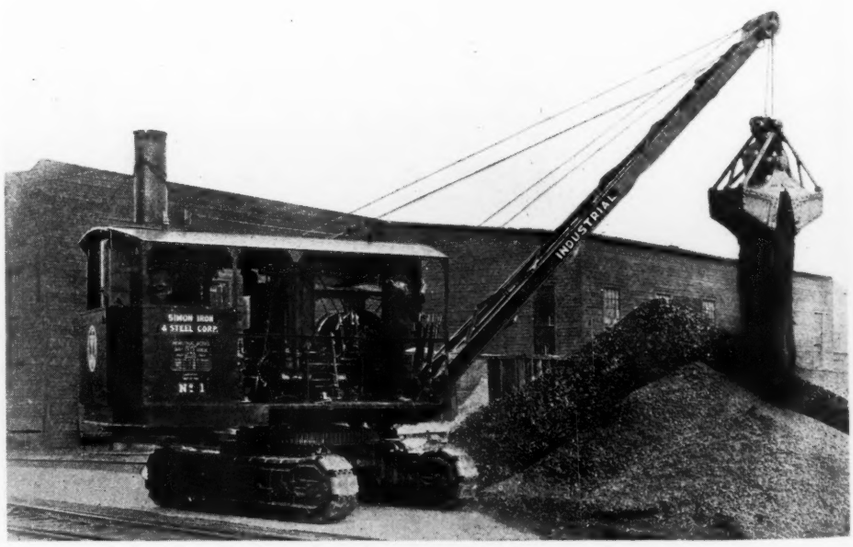
Industrial Works' New 10-Ton Crane

THE Industrial Works, Bay City, Mich., which has built some of the largest locomotive cranes ever built now offers a crane at the other end of the scale, a 10-ton machine with crawler tread, known as Type D.

It is a "general utility" crane and in the rock products field will be of especial value in loading trucks and truck bins and in recovering from stock piles.

The machine is built for either steam, gasoline or electric power as desired. It can be readily converted into a shovel or a pile driver. The maker's description shows that extreme care has been used in designing to have all wearing parts readily accessible.

The makers claim that a most important feature of the crane is the independent and effective control of the traveling, slewing and hoisting motions with the possibility of using these in combination for operation at high speed and in difficult situations.



Industrial works 10-ton crawler crane especially adapted for truck loading and stockpiling

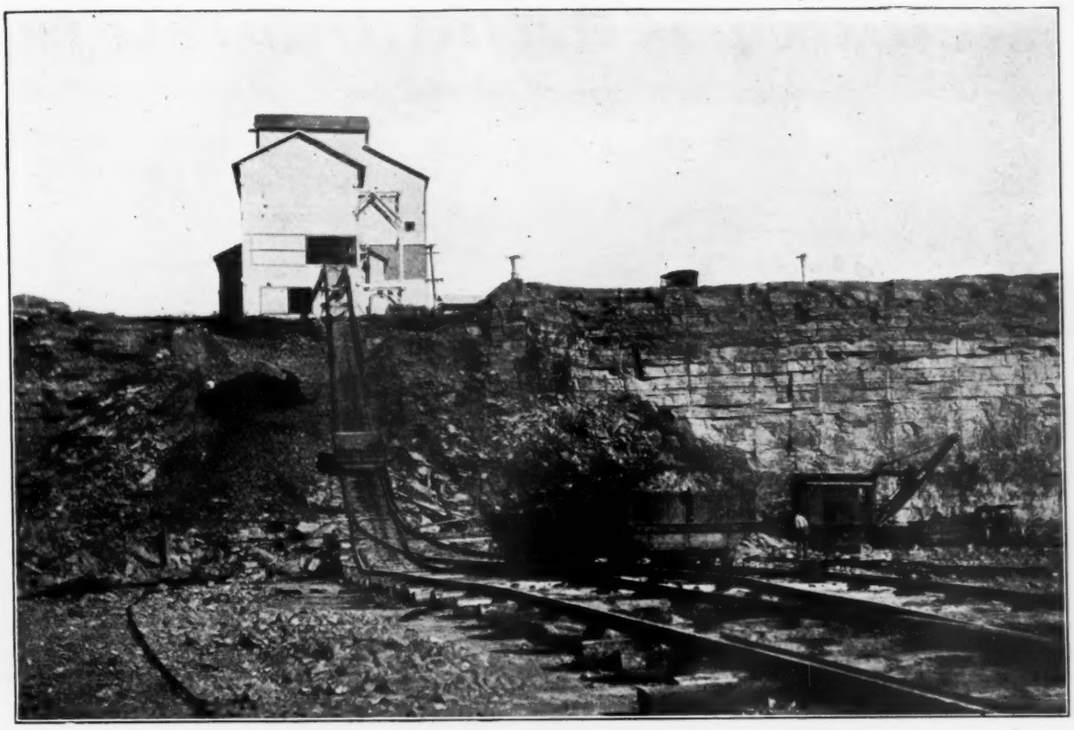
Adamite

ADAMITE is an iron base alloy containing nickel and chromium in proportions which render it hard yet tough. The makers claim that it has the general characteristics of cast iron, but the tensile strength of steel.

Adamite was developed for the purpose of resisting severe abrasive wear and it is claimed that it has more than met expectations along this line. Also several grades of hardness have been developed in order that the conditions in each case under which it must work can be met.

Adamite is used in rolls of all kinds, pinions, gears, guides, dies, forging; dies, bending; dies, hammer; dies, shovel; coupling boxes, crane wheels, crusher jaws, pump plungers, dies for heavy service, ball mill liners, piercing points, plugs and balls for tube mills, glass grinding disks, plungers, muller tires, cement mill rolls, rings, tires and liner plates and all general castings subject to severe wear.

It is made by the Mackintosh-Hemphill Co. of Pittsburgh, Penn.



Maximum Production—

with a minimum of help and operating cost is the result of careful planning and discriminating choice of equipment. When the cost of equipment runs into the thousands, all experimenting must be eliminated. The equipment chosen must be "right."

The Lutz Stone Company of Oshkosh, Wisconsin, holds an enviable position in its field for the economical and efficient operation of its quarry.

In spite of the fact that this concern ships from 550 to 650 tons per day, the number of employees numbers eight.

In common with all well designed and efficiently equipped plants, Allis-Chalmers Manufacturing Company furnished all the motors, as well as crushers, screens, elevators and hoists.

These pieces of equipment always assure exceptional service and economy. Ask the men who use them.

ALLIS-CHALMERS PRODUCTS
Electrical Machinery
Steam Turbines
Steam Engines
Gas and Oil Engines
Hydraulic Turbines
Crushing and Cement Machinery
Mining Machinery

ALLIS-CHALMERS MANUFACTURING COMPANY

MILWAUKEE, WISCONSIN, U.S.A.

ALLIS-CHALMERS PRODUCTS
Flour and Saw Mill Machinery
Power Transmission Machinery
Pumping Engines-Centrifugal Pumps
Steam and Electric Hoists
Air Compressors - Air Brakes
Agricultural Machinery
Condensers

News of All the Industry

Incorporations

Krumroy Sand and Gravel Co., Akron, Ohio, has been incorporated for $25,000. William E. Crisp, attorney.

Alabama Beauxite Co., Sheffield, Ala., has been incorporated for $10,000 by J. L. Andrews, W. E. Martin and W. S. Hatch.

Lynchburg Stone Co., Lynchburg Va., has been incorporated for $10,000. C. G. Loving, president; W. W. Lloyd, secretary.

Cumberland Concrete Co., Cumberland, Md., has been incorporated by Thomas B. Lashley, W. Carl Richards and Jean Cobbey.

Hawkeye Gypsum Products Co., Ft. Dodge, Iowa, has been incorporated for $40,000, by John E. Gustin, John B. Hinks, and others.

Tulsa Crushed Stone Co., Tulsa, Okla., has been incorporated for $20,000 by R. W. Wells, L. R. Duffy, and E. W. Hendrick, all of Tulsa.

Colorado White Marble Co., Gunnison, Colo., has been incorporated for 100,000 shares of no par value by I. A. Smith, E. Miller and H. J. Johnson.

Richmond Sand and Gravel Corp., Petersburg, Va., has been incorporated for $35,000 to $150,000. B. J. Francis, president; H. E. Vaughan, secretary.

Marois Sand and Gravel Co., Worcester, Mass., has been incorporated for $9000. Ralph D. Marois, president; Deus Marois, 8 Wall St., Worcester, treasurer.

Harnette Sand and Gravel Co., Fayetteville, N. C., has been incorporated for $25,000 by L. Teague, Dunn; C. E. Sorrell, Lillington; and W. R. Fleishman, Fayetteville.

Findlay-Thomas Co., New York City, has been incorporated for $5000 to manufacture cement and plaster. Incorporators: R. L. Findlay and E. M. Thomas. (Attorney: T. H. Low, 233 Broadway, New York City.)

Pyro Talc Co., Boston, Mass., has been incorporated for $250,000 to deal in minerals, etc. President, Charles P. King; vice-president, A. D. Huntoon; treasurer, Henry V. Whitaker, 104 Ward St., Newton Center, Boston, Mass.

Green Epidosite Industrial Corp., 209 Bartlett Bldg., Los Angeles, Calif., has been incorporated for $250,000 and is planning the establishment of a plant in Hawthorne, Calif., where it will cut and polish Epidosite, the green granite, of which the company owns a large deposit and quarry near Victorville. George Reid, 305 E. Pennsylvania avenue, Hawthorne, Calif., is president.

Sand and Gravel

Silver Springs Sand and Gravel Co., Perry, N. Y., has awarded the contract for a 200-hp. installation for its plant to Higby & Burgett.

Marquette Road Gravel Co., Marquette, Kan., is reported to be completing installation of tracks, which will accommodate an output of 30 cars of gravel per day.

Richmond, Ind.—Charley Freed and son, Ronald are busy installing their new gravel crusher at the pit just northwest of town on the King farm. The gravel crusher will be used for the roads in Jefferson township.

Kelso, Wash.—G. W. Bashor has arranged to place 1000 yd. of sand and gravel from the Cowlitz river in storage on the Kellogg Transportation Co.'s frontage below the bridge. The gravel will be taken from bars in the Cowlitz river by the dredge of the Columbia Contract Co. and will be transported in barge loads.

Clement & Braswell Gravel Co., Minden, La., are reported to be making plans to install a complete washing and sizing gravel plant on their leases on the Little Missouri river, near Murfreesboro, at an early date. The plant is to be installed with the latest type of gravel machinery and the capacity will be about 20 cars a day, it is stated.

Brazil Gravel Co., Brazil, Ind., is the name of a new business concern which has begun operations on the old Hill farm lying north of the Hill cemetery for the purpose of producing sand and gravel. The company is composed of Greeley R. Huffman, a Putnam county farmer, president; Austin M. Shattuck, a road contractor of Brazil, vice-president; and Charles Murphy, secretary-treasurer.

Little Rock Sand and Material Co., recently organized at Little Rock, Ark., has begun operation east of the Baring Cross bridge in North Little Rock. The company is capitalized at $50,000 and has bought an eight-acre tract on the Arkansas river with a frontage of 1000 ft. Officers are: L. L. McEachin, president; C. C. Kavanaugh, vice-president; Florence J. Donahue, secretary and treasurer; P. F. Connelly, Henry C. McCain, J. C. Carroll and Pat Ring as board of directors.

Quarries

Northwest Granite Co. quarries in Haines, Ore., are to be reopened by Burr & Duncan.

Phenix Marble Co., Kansas City, Mo., has removed its offices from 19th and Olive streets to 609 Scarritt building.

Kentucky River Stone and Sand Co., Lawrenceburg, Ky., produced 100,000 tons of stone for building and highway construction last year, it is reported.

James Meek, a contractor of Chillicothe, Mo., has opened a quarry on the James Gill farm, south of Breckenridge, Mo. The stone is now trucked to Chillicothe to be crushed for pavement work, but it is reported that there is considerable interest in reviving the Breckenridge Crushed Rock Co., which formerly operated a crushing plant in this locality.

La Verne, Calif.—A large rock crusher is being installed along the lower road into San Dimas Canyon, and operations in putting out crushed rock in large quantities will commence shortly. The crusher is being built and financed by Oak Meadows, who lives in the east, and A. G. Lorbeer of Los Angeles. Part of the Laurelette ranch has been leased for this purpose.

Galena, Ill.—It is reported that with approximately 1000 tons of grinding already in sight it looks as though the plan of Rush township farmers to place a crusher is now assured. The limestone committee consisting of Community Chairman Will Logemann, Will Bonjour and Mike Wing, have been making a canvass of the community to ascertain how much limestone grinding can be contracted. Several possible sites for crushing the rock were examined and considerable stone has been analyzed at the Farm Bureau office for the percentage of calcium carbonate.

Fulton, Mo.—A proposal by the Auxvasse crushed rock plant to furnish the material that will be used on street improvement work in Fulton this season was rejected by the city council committee on street and alleys recently. The proposal was submitted by H. A. Meyer, of Auxvasse, through Mayor T. H. Grant. The council committee after making exhaustive estimates on the cost of operating the city rock crusher, found that the city could deliver rock on the streets from its own plant as low as the cost of Auxvasse rock loaded on the cars at the plant there. The saving in favor of operating the city plant, the committee believes, will equal the cost of railroad transportation and unloading and hauling here. The city rock crusher is to be erected on the side of the Jefferson road hill, just beyond the city limits, and will have the rock quarry above it and the landing chutes below it, and thus the rock will have to be handled by hand only in getting it out for the crusher.

Cement

Security Cement and Lime Co., Hagerstown, Md., held its annual picnic recently at Byron's Club House on the Potomac river.

Universal Portland Cement Co., Chicago, Ill., is planning the erection of a stock-house of nine bins to cost about $100,000 at Gary, Minn. Ray S. Huey is the branch superintendent.

Texas Portland Cement Co., Dallas, Tex., has leased space in the office building unit of the Santa Fe terminal and will occupy nearly all of the fourteenth floor of the building facing Commerce at Kendall street. The cement company operates two mills in Texas, one at Cement City, Dallas, and the other at Houston.

Superior Portland Cement Co., Seattle, Wash., has moved its offices from 613 to 1003-1009 Seaboard building. New office equipment has been installed and space for handling an increasing business has been doubled.

Kansas Portland Cement Co., Kansas City, Mo., entertained the Chamber of Commerce good-fellowship trippers when they stopped at the plant at Sunflower on their All-Wyandotte County one-day tour. The plant's present capacity is reported to be 1,250,000 bbl. a year or 4000 bbl. a day.

Birmingham, Ala.—According to newspaper reports, the cement industry in Alabama is showing activity, all five plants operating practically at capacity, little of the product being placed in the warehouse. The Lehigh Portland Cement Co. will shortly have its fourth kiln and unit completed and in operation here. The Atlas Portland Cement Co., Lehigh Portland Cement Co., and the Phoenix Portland Cement Co., are each producing around 1,500,000 bbl. of cement annually, it is stated.

Gypsum

Paul Beygrau is about to establish a plant in Santa Rosa, Calif., for the manufacture of sheet plaster, roofing tile, and other products. The plant will be located on the Southern Pacific Railway. The sheet plaster is an invention of Mr. Beygrau, and can be sawed and nailed, the same as plaster board.

Manufacturers

Universal Crusher Co., Cedar Rapids, Iowa, manufacturer of crushers, pulverizers, screens, elevators, and other machinery for the quarry field, announces that as its business has outgrown its present quarters, the company will move into its new building at C avenue and Eighth street west within a month. R. S. Sinclair is president, and W. L. Harrison is treasurer and manager.

Personals

R. D. Bean has been appointed chief engineer of the Brown Instrument Co., Philadelphia, Penn.

Robert J. Anderson announces that he has resigned as metallurgical engineer of the U. S. Bureau of Mines and is now engaged in general consulting engineering practice, specializing in the metallurgy of aluminum. All communications should be addressed to P. O. Box 111, Fenway Station, Boston, Mass.

Obituary

Arthur Mackey, founder of the Mackey Wall Plaster Co., Great Falls, Mont., who was for a number of years engaged in the gypsum business, died recently at his summer home at Illahee-on-the-Sound, Wash., after a long illness.

Trade Literature

Osgood Co., Marion, Ohio. Circular 245 on the application of traction wheels to railroad type shovels. Copies may be had from the company, on request.

Midvale Co., Nicetown, Penn. Two booklets on extra high-speed steel and carbon tool steel with numerous line and halftone illustrations, and tempering tables.

American Blower Co., Detroit, Mich. Folder describing this company's man cooling fans for use in plants where intense heat prevails. The fan resembles a giant desk fan, weighs several hundred pounds, and has a 4-hp. motor.

Morse Dry Dock and Repair Co., 54th to 57th streets, Brooklyn, N. Y., has issued an attractive booklet describing the company's fuel-oil burning system. There are numerous line and halftone illustrations, and a table of oil gravities, weights, etc. is included, together with a table giving the volume and density of air at various temperatures F.